

The World Heritage List and New South Wales Rainforest – reflections on the events of 30 years ago

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ABSTRACT

The thirtieth anniversary of the nomination of New South Wales rainforests for World Heritage listing provided an opportunity to reflect on the process by which the nomination came about. I discuss the development of ideas about 'heritage', as it applies to the natural environment, the development of the World Heritage List and changing perceptions about the values and importance of rainforest in subtropical and temperate Australia. The concept of a serial nomination and its relevance to a geographically widespread collection of sites is considered. The nomination included sites which contained a range of vegetation, not just rainforest. The significance of the interactions between rainforest and wet sclerophyll forest displayed in New South Wales rainforest is recognised as one of the outstanding values in the nomination.

Key words: rainforest, wet sclerophyll forest, outstanding universal value, Neville Wran, conservation outcomes.

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Introduction

In the decade from the early 1970s to the early 1980s the most high profile environmental/conservation issue in New South Wales was the management of forests, and, in particular, rainforests (Somerville 2005). There was a site-by-site war of attrition between environmental groups and the New South Wales Forestry Commission (as the state government forest management agency was then named). On 26 October 1982, after an all-day Cabinet meeting the New South Wales Government attempted to resolve the issue by making the Rainforest Decision by which a number of rainforest sites were to be transferred from the Forestry Commission for inclusion within new or extended national parks and nature reserves (and several additional areas were scheduled for further deliberations – Hastings, part of Washpool)

The Government was optimistic if it expected the decision to terminate controversy and debate. While formal transfer of the lands to the National Parks and Wildlife Service proceeded – the necessary legislation to revoke the State Forests and transfer the land to NPWS gained assent on 22 April 1983 – the forest industry and timber workers continued to voice their objections and in this they were supported by elements of the opposition (particularly from within the National Party), as well as by some in the right wing of the Labor party. During the 1984 state election campaign, the Coalition indicated a commitment to revisit the Rainforest Decision, with a strong implication that rainforest logging would be resumed in at least some of the sites. Neville Wran, the incumbent ALP Premier, responded by pledging that, if re-elected, his government would prepare a nomination

of the New South Wales rainforests for World Heritage listing. Following the return of the ALP at the election, in mid-1984 work on preparing a nomination commenced, with the final document completed just before Christmas for transmission from the State to the Commonwealth. The 2014 Royal Zoological Society NSW forum thus coincided with the 30th anniversary of the preparation of the nomination and Dan Lunney invited me to reflect on the justification for the nomination and its significance (the request was also to discuss the role of zoology in the process – but that was very small indeed).

The timing is also appropriate in that it permits acknowledgement of major figures who played significant roles in the nomination and who died recently. Jim Somerville was for many years a stalwart of the conservation movement in the state, and treasurer of the Nature Conservation Council. He was one of the major advocates for a Border Ranges National Park. Importantly, as an accountant, Jim scrutinised the Forestry Commission accounts and was able to demonstrate the weakness of the proclaimed business case for continuation of rainforest logging. Also important was that Jim was a friend of the Wrans and was able to express his views directly to the Premier (Somerville 2005). Neville Wran, as Premier, drove his Government's commitment to conservation in general and rainforest in particular, and was able to overcome opposition from within his own cabinet to achieve the Rainforest Decision. Gough Whitlam did not play any role in either the Rainforest Decision or in the listing process. However, his Government had commissioned the Hope Report (1974), which had increased the understanding

and acceptance of the importance of heritage amongst the wider public, and, crucially Mr Whitlam was Australian Ambassador to UNESCO when the World Heritage nomination was under consideration. It is also appropriate to acknowledge Tom Uren, who died in early 2015. Mr Uren was a staunch fighter for conservation, and his role in the establishment of the Australian Heritage Commission was considerable.

Joe Glascott, who died in early 2016 (Stevens 2016), was the environmental journalist at *The Sydney Morning Herald* throughout the rainforest controversies, and one of the first journalists in Australia, if not the world, recognized with his own byline as an environmental reporter. There is a long history of natural history writers in the press, but Joe broke new ground by placing the issues in their political and social context. Somerville (2005) suggested that without the public profile for rainforests created by Glascott's writings the fight to save the rainforests may not have been won.

The history of the rainforest campaign has been recounted from different perspectives by Somerville (2005), Watson (1990) and Turvey (2006). Somerville was at the heart of the campaign and presents a view from the conservation group perspective, but nevertheless offers gentle criticism of some parts of the campaign when arguments advanced by conservation groups were overstated. Watson presents the story from the workers' perspective and is highly critical of the outcome. Turvey had the benefit of not having been a participant and so could take a detached view. With the benefit of 20 years of hindsight and knowledge of the field he provided a broad considered analysis, which recognized the conflict between the various participants and acknowledged that in the early 1980s the time had been ripe for a re-evaluation of longstanding community views about the role of forestry.

Why was gaining inclusion on the World Heritage List regarded as so important by Neville Wran? In order to answer this question it is necessary to explore the concept of heritage and its development in Australia, the establishment of the World Heritage List and the constitutional consequences of Australia being a party to the World Heritage Convention.

The concept of heritage

Heritage is our inheritance – something passed down from the past. In the context of human society, it can be biological (our genetic heritage), our environment (the geological and biological heritage), artefacts and structures from the past (art, crafts and the built environment and cultural landscapes), and the less tangible but nevertheless important, heritage embodied in lore, language, legend traditions and rituals. Collectively our heritage serves to define our identity and places us within the broader scheme of things. The importance of the protection and conservation of heritage is deeply embedded in human

society, although the weight given to different aspects of heritage has varied over time and between different human cultures.

In a more formal sense, concern about heritage as a matter of public policy (as distinct from expressions of individual or local community concern) dates back to the mid-19th century, certainly in part stimulated by the perception of a loss of heritage consequent upon the Industrial Revolution, although protection of the heritage of the Industrial Revolution is now seen as a proper object of modern heritage practice and legislation. The heritage conservation movement (including cultural landscape conservation) and nature conservation both commenced about the same time, but, while some advocates spanned both fields, cultural conservation and nature conservation were probably seen by most people as separate, distinct and possibly antithetical. However, it is notable that Tansley (1945) entitled his clarion call for nature conservation '*Our heritage of wild nature.*'

Nevertheless, despite the relatively long history of including the natural environment as part of our heritage, there is a tendency in many circumstances to assume that heritage applies primarily to culture rather than nature; Thurley (2013) subtitled his book *How Britain saved its Heritage* (and the copyright resides with the government agency English Heritage) and deals solely with monuments and buildings. In the United States heritage is associated with the Heritage Foundation, the right-wing think tank (if that is not an oxymoron) which was very influential during the Reagan administration in the 1980s.

In Australia, the development of the National Trusts (as state-based organisations) commenced with New South Wales in late 1940s. Unlike their counterparts in the UK, Australian National Trusts have never been large-scale land and property owners, but the interests of the Trusts reflected the broad scope of the United Kingdom bodies, and they became effective lobbyists for heritage across the full spectrum from nature conservation to all aspects of culture. However, to most of the general public (and politicians) the National Trusts were viewed as guardians of the built environment and their efforts on behalf of the natural environment remained largely unknown (and, for politicians, submissions from the Trusts advocating nature conservation were frequently unwelcome). The National Trust in New South Wales was, however, a prominent participant in the rainforest battles in the early 1980s, and as well as lobbying for particular sites, produced substantial amounts of educational material to use in schools.

As an expression which encompassed most of what had been included in heritage, the term National Estate was first used in Australia in 1970 by Gough Whitlam (Yencken 1981). Whitlam had picked up the term from President Kennedy but it had originally been coined by Clough Williams-Ellis in the 1940s (Edwards 2011) (Williams-Ellis, the founder of Portmeirion, was an

architect, commentator, and lobbyist for national parks – in the UK meaning of the term).

One of the areas of reform which Whitlam wished an incoming Labor government to pursue was the whole field of the environment, and his Government included the first Commonwealth Minister for Conservation and Environment in Dr Moss Cass. In 1973 the Minister for Urban and Regional Development, Tom Uren, supported by Dr Cass, established a Committee of Inquiry into the National Estate, with terms of reference to examine the nature and state of the National Estate and (to paraphrase a number of terms of reference) to advise on measures which could be taken to preserve and enhance the National Estate. The Committee was chaired by Justice R. M. Hope and included amongst its members the geologist Keith Vallance and prominent members of the conservation movement Milo Dunphy, Judith Wright and David Yencken. The Committee was given a very short timeframe in which to seek submissions and write its report, which was published in 1974. Yencken (1981) regarded the short timeframe as a blessing which concentrated the mind, whereas the parallel committee on museums and monuments was established without a deadline, and effectively died before producing a report. The work of the Hope Inquiry included an evaluation at the national scale of heritage, the like of which had not been conducted elsewhere in the world, and the Report still stands as one of the seminal documents in the history of conservation in Australia.

The Committee recommended the establishment of a permanent commission, and in the period before passage of the necessary legislation, an Interim Committee on the National Estate.

Yencken (1981) wrote of the concept of a Commission for the National Estate – “the term alone was splendid. It gave a special freshness and flavour to the tired, hackneyed heritage alternative. So fond of the term did the Committee of Inquiry, and its successor the Interim Committee on the National Estate, become, that when it was later proposed that the new commission should be called the Australian Heritage Commission there was a unanimous protest, a protest in which I believe Tom Uren and Moss Cass joined. But National Estate was not considered pompous or grandiloquent enough for the new body, and Australian Heritage Commission it was duly dubbed”.

The *Australian Heritage Commission Act* was passed in 1975 – the findings of the Committee, and the Bill which derived from them, received strong bipartisan support – 40 years ago conservation may have generated controversy and debate but it was not subject to the rigid division on party lines that is frequently observed today (Yencken 1981).

One matter that was contentious was the Government’s intention that the body established by the Act be a Commission, and not a committee or a council. This

meant that the Commission was to be independent of the Minister when it came to decision-making. The powers of the Commission were limited, but it could list sites for inclusion on the Register of the National Estate, and those decisions could not be vetoed by the Minister. It also administered the National Estate Grants Scheme, an important source of funding for assessment and evaluation of components of the National Estate.

The National Estate was defined in the *Australian Heritage Commission Act* as – “those places, being components of the natural environment of Australia, or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as for the present community”.

A more succinct summary of the breadth of the concept of the National Estate was provided in the Hope Report – “the things we want to keep”. Although criteria for inclusion on the Register of the National Estate were provided in the Act, the intention was that the Register be comprehensive rather than an elite listing of special places.

Nevertheless, Ashton and Cornwall (2006) suggest that the perception developed that it was a listing of places of “national significance”.

Inclusion on the Register of the National Estate was not affected by tenure, and the Register included both private and publicly owned places. Some of the sites on the Register were of national or even international significance, but the Register also included places with primary relevance to the local community. In terms of number of places, the Register was dominated by items of the built environment, but it was the clear intent of the Hope Committee that natural areas be listed and this was followed up by the Australian Heritage Commission – which had a statutory obligation to identify the National Estate. Although the number of natural places was considerably fewer than that of the historic places, some of the natural places were very extensive. The Australian Bureau of Statistics (2004) identified the scope of the Register “as broad stretches of coastline, desert, forest and national parks, as well as isolated geological monuments and small areas which might provide habitats for endangered plant or animal species are part of the National Estate. It can cover whole villages and suburbs, streetscapes, single mansions, cattlemen’s huts, railway yards and other reminders of the evolution of Australia’s society and economy. Places of Aboriginal or Torres Strait Islander significance such as rock engravings, galleries of rock art, fish traps, carved trees, meeting places, ceremonial sites and reminders of early European settlement, such as mission stations, are part of Australia’s National Estate”.

The Register was a work in progress rather than the definitive list for all time, but in a sense it could be regarded as a Doomsday Book for Australia.

Inclusion on the Register of the National Estate was important in raising public consciousness of the diversity of the natural and cultural heritage of Australia and, as a result, threats to places on the Register were likely to attract protest. However, the direct consequences of inclusion on the Register affected the Commonwealth rather than state or local government. A Commonwealth Minister, or an agency acting under delegation, making decisions which could affect places on the Register was bound to consider the impacts, and (s30 AHC Act) ensure that nothing would be done which adversely affected any place included on the Register, unless there was 'no feasible or prudent alternative', but even in this circumstance damage had to be minimised, rather than there being an absolute prohibition on undertaking the proposed activity. Inclusion on the Register did not offer a guarantee of protection in that it did not mandate positive action to minimise degradation, and s30 applied only to Commonwealth decision making and not decisions made by state or local government. (Nevertheless, planning and consent authorities at state and local level generally took inclusion on the Register of the National Estate into account.) The Commonwealth government obviously had to consider places on the Register which were on Commonwealth land but ministerial consideration was also required when actions of a Commonwealth department or agency (including granting of funding to third parties) might affect a place on the Register. Thus, the relevant Minister deciding whether to sell a Post Office building on the Register, or a Minister making a determination on granting an export licence (for example, for woodchips harvested from a forested landscape included on the Register) were obliged to take s30 into account. (In the latter example, if the woodchips were to be processed into paper for use in Australia the Commonwealth's approval mechanism would not be triggered.)

It was the intention that national heritage legislation would be reflected by measures taken by the states, although development of complementary state legislation was a slow process; the relevant provisions in Tasmania were not enacted until 1995. In New South Wales, the State Heritage listing process is further reinforced by the establishment of schedules, prepared by local government, of heritage items within Local Environmental Plans. The use of these provisions to recognise and protect the natural environment has been limited, the major focus being on the built environment. Importantly, the state and local government provisions in New South Wales operate largely in a planning context; the Commonwealth, except in regard to Commonwealth land, has very few planning functions.

The purpose of this discussion has been to establish that when Neville Wran raised the prospect of World Heritage listing of New South Wales rainforest the concept of heritage was widely known and understood in government and conservation circles.

Although not directly relevant to the story of the rainforest, in reflecting on the lessons from the past it is interesting to record the fate of the concept of National Estate.

Recommendations of the Hope Inquiry, and the concept of the Australian Heritage Commission, received bipartisan support and the establishment of the Commission was accompanied by hope (no pun intended) and enthusiasm for its future. The bipartisanship in support of the Commission did not, however, survive long.

The development lobby saw heritage listing in the built environment as a potential obstruction to their activities, while extractive industries were opposed to listing of extensive natural areas. The independence of the Australian Heritage Commission from government was a particular bone of contention. A number of challenges to the Commission were mounted, of which the most important were proceedings initiated by Mount Isa Mines (MIM) against the proposed listing of the Sir Edward Pellew Islands and surrounding waters (which included mudflats, sea grass beds and mangroves). This matter was eventually resolved by the High Court (*The Australian Heritage Commission v Mount Isa Mines Ltd* [1997] HCA 20). The essential issue in the case was whether the decision to include a place on the Register was a matter solely for assessment by the Commission, or whether it required determination of a jurisdictional fact subject to judicial review. The High Court decided in favour of the Commission. In essence the Commission was a body whose members were appointed for their expertise, and whose decisions were to be accepted. While there could be experts, not members of the Commission, who might have reached a different conclusion it was not the role of a court to adjudicate between experts in circumstances where the legislation had established a body of experts charged with making decisions. (The situation would have been different if the body merely advised the Minister, where the Minister may, or may not, have accepted the advice). The High Court stressed that the processes of the Commission were not immune from judicial review, but the grounds for review were limited and did not include those contended for by MIM. This judgement is important in establishing the nature of the independence of a decision making body established on the same basis as the AHC (for example the Scientific Committee established under the *Threatened Species Conservation Act* (NSW)) – but may also discourage ministers from setting up new bodies on the same model!

However, the judgement came too late to be of assistance to the AHC.

The Register of the National Estate and the Australian Heritage Commission came under increasing criticism from both within and without government. Despite the limited protection conferred by inclusion on the Register, the existence of the Register was seen as an unnecessary constraint on development, and the independence of the Commission was viewed as inappropriate (Ashton and

Cornwall 2006). A major criticism of the Register was that it was too large. By 2007 it had more than 13,000 entries, the majority from the built environment. 13,000 might initially seem a large number, but the Register encompassed a whole continent. In Britain at various times ministers have suggested that the processes there have resulted in the equivalent list being too large and listing imposes unnecessary red tape on growth and development (Thurley 2013), but changes have not eventuated. Currently there are some 400,000 listed buildings and scheduled ancient monuments in Britain (and other mechanisms exist for the natural environment) – 13,000 for a whole continent seems puny in comparison!

In 1997 the Council of Australian governments (COAG) – the Commonwealth and state and territory governments collectively – determined that heritage matters should be the responsibility of the appropriate level of government, and that the Commonwealth would be responsible only for matters of national and international significance. The proposal for change was initiated by the Commonwealth but the states acquiesced.

To give effect to the COAG decision, the Commonwealth established two new Heritage lists – the Commonwealth Heritage List of heritage places owned or controlled by the Commonwealth (such areas would fall outside state jurisdiction) and the National Heritage list of places of outstanding heritage value to the nation. Both were created under provisions in the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The National List is clearly intended to be an elite selection of places, and, although no specific number is provided in the legislation, various ministerial pronouncements over the years indicate that the list should be kept small – in the order of a few hundred rather than thousands of places.

In 2003 the Commonwealth Government enacted legislation to repeal the *Australian Heritage Commission Act* and to establish a new body the Australian Heritage Council, which advises the Minister but does not have the statutory independence previously possessed by the Heritage Commission. The decision making process to list places is thus more open to being influenced by political agendas than was previously the case.

Responsibility for the Register of the National Estate was transferred to the Australian Heritage Council on 1 January 2004. On 19 February 2007 the Register was mothballed, with no further places added to or removed from it. On 19 February 2012 all references to the Register were removed from Commonwealth legislation. The Register exists as a non-statutory list, accessible for archival and educational purposes but with no practical effect.

The loss of the Register as a living document was unfortunate and retrograde. Despite the agreement through COAG of the States and the Commonwealth that functions at state and local government levels

adequately address the objects originally conferred by the AHC Act, I am not convinced that all parties have been equally diligent in developing and maintaining their lists. At state, and even more so at local government level, heritage schedules are dominated by items of built or cultural heritage – the coverage of the natural environment is limited and patchy.

The role of the Register as an evolving catalogue of items of heritage value has been lost – the aggregation of state and local schedules does not amount to a replacement for the Register, particularly given the criteria applied to determine inclusion on the lists which promote recognition of the ‘special’, rather than the ‘good’. Further, there is no longer any sense of representative examples of types of heritage.

The Australian Heritage Commission reacted to nominations for listings from the public, but was also proactive in commissioning thematic studies of particular regions or particular topics. The information gathered during these studies was particularly important in the natural environment at the landscape scale.

One area where the AHC was particularly farsighted was in the recognition of geological heritage. In New South Wales this included funding for the review of important geological sites across the state (Percival 1979).

There is a long history, world-wide, of protecting important geological features as national monuments but in the development of Australia’s network of national parks and nature reserves, geological values were frequently only incidental and not stressed when sites were proclaimed, although scenic values were clearly important considerations in the declaration of a number of the early parks and reserves. In NSW the report to NPWS in 1969 by the Scientific Committee which provided a vision for the development of the NPWS Estate included recommendations for a series of geological sites to be protected. e.g. Talbragar Fish Fossils, Shearsby’s Wallpaper, Burning Mountain, Sawn Rocks of Bobbiwaa etc. One of the earliest sites protected was Burning Mountain (as a nature reserve). From the 1970s NSW NPWS incorporated a series of geological sites into its investigations and protection programme, with advice being provided by the Geological Society. (Personal Communication, Peter Hitchcock 2017)

The importance of protecting geological and geomorphological sites has achieved greater prominence in recent decades (Brocx 2008). Tasmania was amongst the leaders in this new interest in geological heritage, and probably was the first jurisdiction to use the term geodiversity as an analogue to biodiversity in legislation. (As with biodiversity the term geodiversity was in use long before its formal definition.) In New South Wales, with the exception of karst conservation which is specifically provided for in legislation, recently there has not been

high-level support for advancing recognition and conservation of geological sites.

The grand vision promised by the Hope Inquiry failed to be realised. The goodwill, knowledge base and support of the many individuals and conservation groups who were involved in making nominations for inclusion of places on the Register of the National Estate was needlessly discarded. The good work which was done was largely ignored by the media, which focussed on the higher profile lobbying campaigns seeking declaration of new national parks and nature reserves. The nomination of natural and cultural landscapes for inclusion on the Register of the National Estate was important in giving recognition to the importance of the necessity of maintaining ecologically functioning landscapes at a large scale regardless of land tenure.

There can be no doubt that the public recognition of the heritage values of features of the built environment was promoted by the heritage listing processes in all levels of government, although in practice listing concentrated on individual buildings rather than townscapes. Many National Estate listings did not include much of the curtilage of buildings or place them in a broader context (the process often being referred to as shrink wrapping the properties). The decision in January 2015 of the Federal Minister to include the whole of the City of Broken Hill on the National List is a striking break with past practice.

World Heritage

When the Wran government proposed nomination of the New South Wales rainforests for inclusion on the World Heritage list, the community was familiar with the concept of heritage, the possibly less so with World Heritage and its implications.

The origins of the World Heritage concept lie in the Nile Valley in southern Egypt. In 1954 the Egyptian government decided to build a dam at Aswan (which came to be known as the Aswan High Dam – replacing the earlier Aswan Low Dam, built by the British in the early 20th century). The construction of the High Dam was seen as a major nation building project, but also became a pawn in Cold War diplomacy, with the major part of the foreign aid for the project coming from Russia.

The construction of the dam has had major environmental impacts downstream, including reducing the sediment input to the floodplain and to the Nile Delta. However, at the time of construction environmental issues did not warrant much attention in approval processes. However, what did attract world attention was that flooding the valley would have impacts on major archaeological sites.

UNESCO (the United Nations Educational Scientific and Cultural Organisation) launched a campaign to safeguard the archaeological sites, securing some US\$80 million,

including contributions from a large number of countries. A number of temples including Abu Simbel and Philae were dismantled and rebuilt above the highest water level; two other temples were moved to overseas museums. The success of the campaign for the Aswan temples led to other campaigns to support protection of other sites including Venice and its lagoon (the future of which is still uncertain) and Borobudur in Indonesia. UNESCO and ICOMOS (the International Council on Monuments and Sites) also developed a draft convention “to protect the common cultural heritage of humanity”.

In the United States, a conference held at the White House in 1965 promoted the concept of a World Heritage Trust to ‘preserve the world’s superb natural and scenic areas and historic sites for the present and the future of the entire world citizenry’. The IUCN (the International Union for the Conservation of Nature) developed similar proposals focused on natural and scenic areas in 1968. The concept was a major item of discussion at the 1972 Conference on the Human Environment in Stockholm (the first Earth Summit), where it was strongly supported by the United States government (President Nixon was very much in favour – support for environmental conservation in the 1970s was not something which was divided on party political lines).

Shortly after the Stockholm conference an agreed text for the Convention concerning the Protection of the World Cultural and Natural Heritage was adopted by the General Conference of UNESCO on 16 November 1972.

The convention came into force on 17 December 1975 when the requisite number of nations had become signatories. The convention has now been ratified by more state parties than almost any other international treaty. Currently 188 United Nations member states plus four others are signatories. Australia was one of the earliest ratifiers. The signatory parties have to be nation states (or accepted as equivalent, one of four non-United Nations member states who are signatories is Palestine). The only eligible Australian government to be a signatory is that of the Commonwealth, the state and territory governments cannot be signatories in their own right. (Antarctica is not a sovereign state, and territorial claims such as those of Australia are not internationally recognised – as a consequence it is not possible for sites on the Antarctic continent to be included on the World Heritage List, although subantarctic islands which are territories of nation states can be included on the list).

The Convention provides, *inter alia*, for a World Heritage List of places of special cultural or natural significance. The list is maintained by the World Heritage Program, administered by the UNESCO World Heritage Committee, made up of 21 UNESCO member states elected by State Parties to the Convention at the UNESCO General Conference. At various times Australia has been a member of the Committee.

Even if a place is included on the World Heritage List it remains part of the nominating country and, in the Australian context, part of a state rather than becoming Commonwealth land. However, the Convention requires that the State Party (Australia) take responsibility for ensuring protection of a site, even if in another jurisdiction, and this is reflected in Commonwealth legislation which facilitates the Commonwealth taking legal responsibility for ensuring protection and management of World Heritage sites. Inclusion on the list does not involve surrender of sovereignty – even though in the 1980s the Queensland Premier Mr Bjelke-Petersen claimed, quite incorrectly, that listing the Wet Tropics would mean Colonel Gaddafi (the then dictator of Libya) would be running North Queensland (at the time Libya was a member of the World Heritage Committee having been democratically elected for a term. Libya has a number of world Heritage sites, nominated under cultural criteria). However, the World Heritage Committee monitors the condition and management of places on the List, and can reach conclusions unfavourable to the relevant sovereign state.

As of February 2017 the list was made up of 1052 sites. Reflecting the historical origins of the list, the majority are from the cultural/built environment (818 sites, as against 203 natural and 35 mixed – i.e. listed under both cultural and natural criteria). Although the natural sites on the list are fewer in number than the cultural sites, some of the natural sites are very extensive (for example the Great Barrier Reef).

When a state party nominates a site for potential inclusion on the World Heritage List, the World Heritage Committee refers the nomination to ICOMOS (for cultural sites), IUCN (for natural sites) or both (for sites nominated as mixed) for detailed assessment. The reviews are thorough and for new nominations (rather than minor boundary amendments or adjustments) would include site visits in addition to a series of expert desk top reviews. The report and recommendations of the review body are considered by the World Heritage Committee at its annual meeting. The Committee from time to time has reached decisions not in accord with those of the review body/bodies. While opponents of World Heritage listing (either in general or for particular places) suggest that the review process merely acts as a rubber stamp for the nominating government's proposal, this is far from the case and rejections, deferrals, or substantial modifications of nominations are not uncommon. Nominations are not infrequently withdrawn before formal consideration by the Committee, sometimes to avoid the embarrassment of predicted rejection.

In order to be inscribed on the World Heritage list, the place must be of outstanding universal value (OUV), meeting at least one of 10 criteria. The wording of the criteria is currently:

“Cultural criteria

i)

to represent a masterpiece of human creative genius;

ii)

to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architectural technology, monumental arts, town–planning or landscape design;

iii)

to bear a unique or at least exceptional testimony to a cultural tradition or to a civilisation which is living or which has disappeared;

iv)

to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;

v)

to be an outstanding example of a traditional human settlement, land–use, or sea–use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;

vi)

to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);

natural criteria

vii)

to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

viii)

to be outstanding examples representing major stages of Earth's history, including the record of life, significant on–going geological processes in the development of landforms, or significant geomorphic or physiographic features;

ix)

to be outstanding example examples representing significant on–going ecological and biological processes in

the evolution and development of terrestrial, freshwater, coastal and marine ecosystems and communities of plants and animals;

x)

to contain the most important and significant natural habitat for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation."

(from whc.unesco.org/en/criteria/ accessed 3 March 2015)

The criteria that applied in 1984 were developed before the concept of biological diversity (biodiversity) had been developed. The concept of biodiversity is now acknowledged in criterion x), although the wording of the criterion draws attention to the species level of biodiversity (and in particular threatened species) rather than embracing the full scope of biodiversity at all levels. The criterion nevertheless encompasses biodiversity as defined in the Convention on Biological Diversity and so presence of important and significant ecosystems/communities could be raised. Unfortunately the public and politicians tend to think of biodiversity solely in terms of the species component (Adam 1998). The particular wording of criterion x) might reinforce this (mis)interpretation of biodiversity.

Most, but not all, of the sites on the list meet several criteria.

Inclusion on the list is not only on the basis of attributes which attract praise or admiration. There are also sites which are listed because they are associated with events which human society should not forget – the Auschwitz–Birkenau concentration camps and ground zero at Hiroshima fall into this category. The Australian listing of the Australian convict sites, for which criteria iv) and vi) were invoked, also embodies, at least in part, recognition of extreme hardship and suffering. The Auschwitz and Hiroshima listings were extremely controversial and not all member states were supportive, and it is unlikely that other proposals with similar themes would be successful. Some feel that those particular listings reflected the black armband school of history. (It would be difficult to interpret any of the criteria for natural areas so as to permit listing of sites of extreme environmental degradation even if such a listing would serve as a warning against mismanagement.)

Australia currently has 19 World Heritage properties, 3 listed on cultural criteria, 12 on natural criteria and 4 on both cultural and natural criteria. Prior to the listing of the New South Wales rainforests, 5 Australian places had been inscribed on the list, the Great Barrier Reef, Kakadu, Willandra Lakes Region, Lord Howe Island and the Western Tasmania Wilderness National Parks, (later expanded and renamed 'Tasmanian Wilderness'). The very

strong representation of natural areas in Australia's World Heritage sites differs from the spectrum of nominations in other countries. Amongst the cultural sites Australia has the distinction of having the youngest building yet listed on the World Heritage list – the Sydney Opera House.

Why is World Heritage listing important in Australia?

The 1052 World Heritage sites currently included on the World Heritage list are within 165 of the signatory states (not all parties to the Convention have places on the World Heritage List). Nominations for listing have not been a matter of great controversy in the majority of cases. However, in Australia, several of the listings generated considerable debate between states and the Commonwealth.

The reasons why the World Heritage List has such a high profile in Australia relate to the particular features of our constitution. The Australian Constitution, which came into effect at Federation in 1901, reflects an era before conservation and the environment were viewed as matters which involve governments, so neither word is mentioned, except for one mention of water conservation. The interpretation of the Constitution which then prevailed was that matters not specifically included in the Constitution were solely the responsibility of the states. Thus as interest in nature conservation developed it was viewed as a matter for the states not the Commonwealth, although major wildlife research programmes with practical applications to conservation and management were conducted by CSIRO, and the Commonwealth also provided funding for the growth of universities in the 1960s and 1970s, at a time when ecology was one of the cutting edges of biology – however this was a long way removed from being involved in decision-making about the establishment and management of reserves. One of the first Commonwealth initiatives to take a more active role in nature conservation was the Whitlam government's purchase of Towra Point in Botany Bay, in order to give practical effect to the then recently signed JAMBA (Japan Australia Migratory Birds Agreement). The then state government (the Askin led coalition) commenced High Court proceedings which were overtaken by events. The Fraser Coalition Government transferred Towra Point to New South Wales, where it was designated a Nature Reserve. The reserve is now recognised as an internationally significant wetland listed under the Ramsar Convention. The constitutional question of whether the Commonwealth could establish conservation reserves within a state was therefore never adjudicated.

Although matters which come directly within the purview of Commonwealth are limited in the Constitution, there are provisions which could allow for the scope of the Commonwealth's involvement in environmental matters to be greatly extended. The first is the ability of the Commonwealth to control exports from Australia – a

provision used by the Fraser Government to prevent export of heavy metal ores won by sand mining on Fraser Island – thus limiting damage to the island's environment, and ultimately (several decades later) paving the way for conservation and World Heritage Listing.

Section 51 (i) of the Constitution enables the Commonwealth to legislate with respect to matters of “trade and commerce with other countries and among the states”. A number of cases over the years in the High Court have given very broad meaning to ‘trade and commerce’. Section 112 of the *Customs Act* prohibited export of mineral sands, without authorisation by the Minister. The mining company *Murphyores* sought approval to export mineral sands mined on Fraser Island. The Minister declined to authorise the export, pending an environmental enquiry into sand mining on the island. *Murphyores* questioned the constitutional validity of the Minister's decision and moved in the High Court for an injunction on the study and a declaration that the Commonwealth could not make a prohibition for environmental purposes. The High Court in a unanimous decision (*Murphyores Inc. Pty Ltd –v – the Commonwealth of Australia* [1976] HCA 20), held that the prohibition provisions of the *Customs Act* were a valid exercise of power under section 51 (i) of the Constitution; the motive and purpose of the prohibition was irrelevant to the exercise of power.

The second was that the Constitution makes clear that only the federal government can enter into treaties with other governments (be they bilateral agreements like JAMBA, or multinational). If, in order to give effect to a treaty, the Commonwealth enacts legislation, then, to the extent that the Commonwealth legislation is in conflict with that of any state legislation, the Commonwealth will prevail.

This provision was tested in the Tasmanian dam case (Coper 1983).

One of the most powerful bureaucracies in Tasmania was, for many years, the Hydro-Electric Commission (HEC). The provision of cheap electricity was seen as fundamental to the development of industry and the economy, and questioning the activities of the Commission was something that just did not happen. This old order changed in the late 1960s when the proposal to flood Lake Pedder was advanced, the campaign in opposition was unsuccessful (the flooding occurred in 1972) but for the first time the saving of a place in Australia became a national, and indeed international, concern. (In all the recent controversy over the award of an Australian knighthood to Prince Philip, commentators did not mention his role in the establishment of the Australian Conservation Foundation, of which for a time he was President, nor that, in 1972, he wrote the preface to the *Pedder Papers* (ACF 1972)). Lake Pedder marked the start of national conservation/environmental activism in Australia and

was seminal to the development of green politics in Tasmania, and subsequently the rest of Australia.

In 1978 the HEC proposed a major new scheme involving the damming of the Gordon River below its confluence with the Franklin River, in the heart of what was beginning to be recognised as the world's largest temperate wilderness (Gee and Fenton 1978). This proposal immediately aroused opposition. In 1981, the then Labor state government created the Wild Rivers National Park which included the Franklin River and proposed that south-west Tasmania be nominated for World Heritage Listing.

In 1982 the Labor state government was replaced by a Liberal administration which supported the construction of the dam and opposed the World Heritage nomination. The Commonwealth government, also Liberal, did not withdraw the nomination and offered compensation for not building the dam. While it is conventional wisdom that nothing should stand between a State government and a bucket of Commonwealth money, in this instance the Tasmanian government was not to be dissuaded and preparatory works commenced, triggering massive national and international response. The arrest of protesters, including the British botanist and TV presenter David Bellamy, achieved global media coverage. In November 1980 the World Heritage Committee inscribed south-west Tasmania on the World Heritage List, although noting the IUCN's evaluation which pointed to the major threat to the integrity of the site if the dam were to proceed.

The future of south-west Tasmania became a major issue in the 1983 federal election, with the Labor party openly associating itself with the Wilderness Society's 'No Dams' campaign and promising to legislate to prevent clearing, excavation and other activities within the Tasmanian World Heritage Area. Upon election, the incoming Labor government enacted the *World Heritage Properties Conservation Act* with the intent of giving the Commonwealth the power to override states in relation to World Heritage matters.

The Tasmanian government did not meekly surrender to the Commonwealth, thus paving the way for a High Court action.

The resulting Tasmanian dam case (Coper 1983) (*The Commonwealth of Australia – v – The State of Tasmania* 1983 [HCA] 21) was a case of historic importance, greatly expanding the opportunities for Commonwealth involvement in a wide range of issues.

The major task of the High Court was to interpret section 51 (xxix) of the Constitution which provides the federal parliament with the power to make laws with respect to ‘external affairs’. ‘External affairs’ are not explicitly defined. The federal government argued before the Court that the *World Heritage Properties Conservation Act* gave

effect to an international treaty to which Australia was a party. The Tasmanian government (with the support of the Attorneys General of other states) argued that such an interpretation of section 51 (xxix) would give the Commonwealth broad new powers to override states and limit their rights to legislate in many areas. Certainly in 1901 there were few broad international treaties, and to the extent the Founding Fathers considered future developments in the international sphere, their vision did not extend to the concept of environmental treaties.

The High Court agreed (by a 4 to 3 majority) with the Commonwealth position. The High Court was not concerned with the merits and desirability of the dam proposal; the issue before it was whether or not the World Heritage Convention fell within the heading 'external affairs' and thus whether the Commonwealth could enact relevant legislation permitting it to override the states. Although the decision was by the closest possible margin it established a precedent binding on the Court. Subsequently, when Queensland attempted to prevent the Commonwealth nominating the Wet Tropics for World Heritage listing, the Court unanimously found for the Commonwealth. The Queensland Wet Tropics nomination was made despite objection from the state government (In the case of Southwest Tasmania the nomination had originally been proposed by the state government, and when a subsequent state government sought to withdraw the nomination the Commonwealth declined). The confirmation by the High Court of the ability of the Commonwealth to make nominations for World Heritage listing without an initiating state proposal had major implications for environmental groups and how and where they direct their lobbying.

The revision of Commonwealth environmental legislation in the late 1990s resulted in the *Environmental Protection and Biodiversity Conservation Act 1999* which included a series of triggers (matters of National Environmental Significance) for Commonwealth involvement in approving proposals within states. World Heritage listing was one trigger but the Act also recognised the consequences of other international treaties including the Ramsar Convention, the Bonn Convention (dealing with migratory species) and the Biodiversity Convention which, in relation to threaten species and ecological communities, draws many development proposals into the Commonwealth net. The Commonwealth government, however, has limited planning functions, nor does it have staff on the ground to investigate proposals. There have therefore been a number of attempts by the Commonwealth to delegate many of its powers under the *EPBC Act* to the states; the majority of environmental groups are extremely wary of these proposals. The Commonwealth, however, will remain the government responsible for environmental matters in an area of ocean larger than its landmass as a consequence of the provisions of the United Nations Convention on the Law of the Sea.

The Wran Government's proposal to seek nomination of the New South Wales rainforests for World Heritage Listing came in the wake of the Tasmanian dam decision and sought to take advantage of the outcome. Successful nomination would provide an extra level of protection to the protection afforded by national park or nature reserve status, so that any attempts by any future state government to undo the Rainforest Decision would require agreement of the Commonwealth and of the World Heritage Committee (as removal of World Heritage Listing would require the Commonwealth to present the case to the Committee). Rejection by the World Heritage Committee in 2014 of Australia's proposal to remove some areas from World Heritage Listing in south-west Tasmania demonstrates that the World Heritage Committee will examine any proposal from a state party thoroughly and will not provide automatic endorsement.

As a result of the various battles between States and federal governments over a number of listings, the World Heritage List has a high public profile in Australia while international media coverage of events in Australia has helped raise international awareness of a the World Heritage concept. These can be regarded as positive outcomes for international conservation. On the other hand, the intense politicisation of conservation in Australia is undoubtedly viewed by some (both within and outside Australia) as inappropriate and potentially counterproductive. The tourist industry regularly exploits World Heritage status as a valuable tool in international marketing.

One of the dangers of the nomination process in Australia being conducted in a media spotlight is the potential consequences of adverse outcomes. Nominations for additions to the List from state parties are not guaranteed success. If the nomination process has been relatively low key, then rejection is not likely to be attended by much publicity. Australia so far had been successful in its nominations, although several have been damned close run things, and a number have been modified during the process. The attempt to reduce the extent of the listing in Tasmania in 2014 was not successful and reflected adversely on the Commonwealth for supporting the delisting – although many in the environmental movement would have seen the decision as reflecting the independence and impartiality of the IUCN and the World Heritage Committee. It is my impression from a number of informal discussions that some feel that the high stakes approach to a number of Australian nominations places assessors in an invidious position. There is also a view that Australia possibly has enough listed sites – how much more eucalypt vegetation do we need on the list, and Australia would be pushing its luck if new natural nominations were to emerge (although in the cultural sphere there does not seem to be the same response to nominations of additional medieval cathedrals). One of the consequences of listing is that Australia's

management of its World Heritage sites comes under international scrutiny, and currently how Australia manages threats to the Great Barrier Reef is attracting considerable criticism. Were the Commonwealth to allow some of the proposals for development suggested by the Tasmanian government in southwest Tasmania the international reaction could be adverse.

New South Wales rainforest – outstanding universal value?

Nominating the New South Wales rainforests for inclusion on the World Heritage List in order to provide extra layers of protection was not in itself a justification for listing to occur. Rather it had to be demonstrated to the satisfaction of the World Heritage Committee that the nominated property had outstanding universal value under at least one of the specified criteria. Overcoming this hurdle was necessary, but not sufficient for a successful nomination; in addition the Committee had to be convinced of the protection, management, and integrity of the property; that is that threats had been identified and were, or would be, managed, and that appropriate management arrangements were guaranteed.

The Rainforest Decision of 1982 had recognised that the opportunities for conserving old-growth rainforest in New South Wales were rapidly diminishing, and that rainforests were ecologically significant. In a general sense this included recognition of some of the World Heritage listing criteria, but there had been no critical evaluation or detailed application of the criteria to New South Wales rainforests.

There were a number of potential difficulties which faced those preparing a nomination, particularly as the nomination was initiated by the State and yet any formal nomination would need to be made by the Commonwealth, and that evaluation would take place within a global context.

Australians' perception of the nature of rainforest has been discussed by Adam (1992) and Bowman (2000). Rainforest is a relatively recent term, it was not part of the English language in 1788 and, although rainforest was clearly a source of a range of resources for Aboriginal people, we are largely ignorant of the indigenous names that pertained to rainforest, either generically or to particular subtypes except in north Queensland. Nevertheless the early European colonists encountered rainforest very shortly after the first landing, and recognised that it was different from the predominant *Eucalyptus* dominated sclerophyllous forest and woodland (sclerophyll was also not part of the late 18th-century lexicon – it was a term developed by the German – Central European school of phytogeography and applied to Australian vegetation by Schimper (1903) and Diels (1906). The adjective sclerophyllous came to be applied to much Australian vegetation in the technical and scientific literature, but is

still not a term familiar to the average citizen in the street, unlike rainforest, which as a result of popular literature and TV documentaries is now widely understood).

The colonists referred to rainforest as scrub and brush (and less frequently as jungle – a term derived from India, and in Australia commonly applied to monsoon thickets in the tropical north, as in place names such as Rum Jungle). How the words scrub and brush came to be applied to rainforest is still not adequately understood (Adam 1992), but rainforest played an important role in the colonisation of the eastern seaboard – rainforest is a source of valuable timber, in particular red cedar (*Toona ciliata*, a member of the mahogany family Meliaceae) (see Vader 1987, Adam 1992, McPhee 2006). Cedar getters were frequently the first Europeans to venture into the rainforests of the valleys and mountains of New South Wales and what is now Queensland, often in advance of official colonisation (Vader 1989, Greer 2014). Red cedar was effectively economically extinct long before the Rainforest Decision, but young trees are still widespread and the species does not qualify for threatened status. Other rainforest trees were utilised for a range of specific purposes (Francis 1929), but were not as valuable as red cedar. Rainforest was more valued as an indicator of agricultural potential, and lowland rainforest was extensively cleared for the establishment of dairy farms and crop production (Adam 1992; Rose 2014).

In New South Wales the Second World War brought great changes to the rainforests. Prior to the War, rainforest logging was for saw logs. In the 1930s research by the Forestry Commission resulted in technology for making veneers from some rainforest species, which coupled with new glues enabled the manufacture of plywood. The new plywood was in great demand during the War, being used in the manufacture of Mosquito aircraft and small warships. New peeling mills were established and the harvesting of favoured species increased greatly. Coachwood and other trees from warm temperate rainforest were in particularly high demand, as the characteristics of their timber made them suitable for peeling and gluing. The legacy at War's end was a new industry of seemingly limitless potential. However, there were few, if any, reliable estimates of the available timber resource, and the allocations granted to the mills were too large to support a sustainable industry. Rainforest timbers were also used for purposes that did not require their special properties such as coffins and formwork in building construction – requirements built into Australian Standards limited opportunities for other timber sources to be substituted. By the late 1970s it was apparent that the available supplies would soon run out. Conversion of rainforest from forestry control to conservation management advanced the inevitable end of the industry. This is not to say that sustainable logging of rainforest was impossible, but the length of the cycle would need to have been in the order of hundreds of years. Given the limited area of rainforest in New South Wales,

logging on such a cycle would mean that the area which could be harvested in any one year would be very small, far smaller than the actual areas being logged. Nevertheless, during the rainforest battles part of the resolution was to remove high conservation value forests from allocation, but find resources from other areas to bridge the gap until the industry was restructured. Government funding was available for re-equipping mills. One of the largest mills in New South Wales utilising rainforest timbers (Big River Timbers) successfully converted to producing plywood from eucalypts (Pidcock 2005)

The term rainforest entered into the English language with a translation of *Regenwald* as applied in Schimper (1903). The translators of Schimper did not follow the German aggregation to form of a single noun and referred to 'rain-forest'. Richards (1952), in what was for many years the seminal textbook on the world's rainforests, dropped the hyphen in favour of 'rain forest'. In Australia the convention since Baur (1968) has been to use a single word 'rainforest' – "The spelling of "rainforest" as a single word, rather than the commonly used two words (rain forest) is preferred as indicating the community's status as a fully independent plant formation and to avoid undue emphasis on rain as the sole determining environment factor". 'Rainforest' is increasingly becoming the internationally used word, although there are still some journal editors and publishers who insist on the two word form.

An important issue in the arguments before the Rainforest Decision was the definition of rainforest (Adam 1992; Bowman 2000). Although Schimper (1903) had recognised a broad range of vegetation types as encompassed by rainforest, including temperate and subtropical, in the popular imagination rainforest was implicitly 'tropical rainforest', which covered Amazonia, wet tropical Africa and Southeast Asia. Australian foresters and ecologists embraced Schimper's broad approach, with the addition of the apparently oxymoronic dry rainforest. Dry rainforest occurs under drier, at least seasonally, conditions than other rainforest types, with generally a significant deciduous component in the canopy, and, most importantly, an absence of *Eucalyptus*. It is the absence of *Eucalyptus* which most clearly separates dry rainforest from sclerophyll forest and woodland. Collectively the various forms of rainforest in Australia occupied a very small proportion of the continental landmass. While foresters and ecologists were in agreement that those communities called rainforest were indeed rainforest, even if the general public might not have embraced such an expansive definition, there was fierce disagreement as to whether what was variously referred to as wet sclerophyll forest, tall open forest or moist hardwood forest was rainforest.

This type of forest is one of the most spectacular in the world – exceptionally tall open sclerophyll forest (*Eucalyptus* or brush box – *Lophostemon confertus*) over

a mesic rainforest lower storey. That this forest type was the centre of debate was surprising given that Schimper (1903 – pp 484 – 486) and Richards (1952) both acknowledged its rainforest status. A major reason for the divergences of opinion was the very high economic value of the tall emergent canopy trees. The definitional issue was central to the Inquiry presided over by the retired judge Simon Isaacs into proposed logging, by the Forestry Commission, at Terania Creek in the Nightcap Range (Isaacs 1982; Turvey 2006). This Inquiry provided a textbook example of how not to conduct a public Inquiry – a judge who had no understanding of many scientific concepts but who insisted on 'yes' or 'no' answers to questions and did not entertain longer, more nuanced responses, counsel with an extremely adversarial approach, and witnesses at cross purposes. Several of the leading scientists who attempted to give evidence were deeply scarred by their experience of the process. Behind-the-scenes, attempts were made to prevent witnesses from some government agencies presenting evidence critical of the Forestry Commission (Turvey 2006). The Inquiry continued from late 1979 to September 1981 when the report was submitted to the Minister, but it was not tabled in Parliament until 1982. Isaacs (1982) recommended that the Forestry Commission implement its harvesting plan (with conditions), including the logging of brush box, which the judge decided was not a component of rainforest. The judge's findings were hailed by the Forestry Commission and the forest products industry as a vindication of their position, but if it were a victory, it rapidly proved to be hollow. The extended Inquiry had brought time while the no-logging advocates strengthened their position in the eyes of a wider (urban) public, and the Rainforest Decision completely ignored Isaacs' (1982) recommendations.

Tall open eucalypt canopies over a lower stratum of rainforest are a well-developed phenomenon in Australian, and, with *Eucalyptus deglupta* as emergent, related forests extend as far north as the Philippines – even if not rainforest they could justify outstanding universal value status in their own right. *Eucalyptus* cannot regenerate in dense shade, so persistence of the forest type would require a periodic fire disturbance regime to create conditions suitable for sclerophyll regeneration. The dynamics of the rainforest/wet sclerophyll interaction continue to be a focus for research (Warnam and Moles 2009, Warnam *et al.* 2013, Tng *et al.* 2013, Tng *et al.* 2014), but greater ecological similarity of the 'giant' eucalypt forests to rainforest than to sclerophyll forest is confirmed (Tng *et al.* 2013). In this account the term wet sclerophyll continues to be used as it reflects the terminology used in the 1970s 1980s, and structurally these forests are very distinctive even to a lay observer. However, it is probably time that we recognized the ecological status of the community and abandoned the use of wet sclerophyll in favour of 'rainforest with

emergent eucalypts'. The Rainforest Decision, as well as protecting rainforest (as the term was then used), was also about giving protection to wet sclerophyll forests, even if that might have been immediately obvious to the wider public. The resistance of the Forestry Commission to the changes wrought by the Rainforest Decision was strongly influenced by the economic value of the eucalypt and brush box emergents. The Forestry Commission took to referring to these forests as hardwood forests, which possibly served to further confuse the public's understanding of their nature and values. The Australian use of 'hardwood' is at variance with international understanding of the difference between hard and soft wood species – which is that conifers produce softwood and angiosperms hardwood. (This is regardless of the actual physical hardness of the timber, thus balsa, being an angiosperm produces, as I was taught as an undergraduate, hardwood.)

Neville Wran's decision, immediately after his re-election, to have prepared and submitted a nomination of the NSW rainforests by the end of the year was a challenge – but a very tight deadline does sharpen the mind!

The process was driven by two outstanding public servants, who played major roles in the Rainforest Decision – John Whitehouse from the Department of Environment and Planning, and Peter Hitchcock from the NSW National Parks and Wildlife Service. Peter has encyclopaedic knowledge of the State, and, with a background in forestry, a keen interest in rainforest. I was engaged to develop a case for listing from an ecological perspective. In completing the task we were ably assisted by many members of the NSW National Parks and Wildlife Service who located data, provided advice and performed the essential task of preparing the maps, and of other agencies such as the Royal Botanic Gardens.

It has to be remembered that the preparation of the nomination took place several years before the first word processors. The nomination document was a thick pile of typewritten pages (there were at least electric typewriters) and each photograph had to be glued individually to the page. Each copy was thus an individual product, and it is scarcely surprisingly that there are only a few copies. Most of the nomination document was subsequently made available as a book (Adam 1987).

In preparing the nomination a decision taken was that the sites chosen would have formal protected status (National Park, Nature Reserve, Flora Reserve) and rainforests on other Crown tenures or on private land would not be considered. There is nothing in the World Heritage Convention which would preclude nomination of private land, and a number of World Heritage properties, including the Wet Tropics, encompass areas in private ownership. The decision to limit the range of sites under consideration partly reflected the then lack of data for

rainforest on private land, but it was also thought that it would be much easier to argue the case for integrity on sites with formal conservation status than it would be for rainforest under other tenures. It was also agreed that sites included in the nomination would be whole reserves, and not just stands of rainforest. This was to a large extent a pragmatic decision; the reserves had been surveyed and could be defined by unambiguous cadastral boundaries. Although maps showing the distribution of rainforest had been prepared, and were included in the nomination (New South Wales Government 1984, Adam 1987, Fig. 1) the accuracy of boundaries on these maps, while sufficient for the purpose of nomination, would be insufficient without on-the-ground survey to give a legal definition of the areas.

Given the intensity of the debate about the status of wet sclerophyll forest seen in the Terania Creek Inquiry (Isaacs 1982), and at other contentious sites, inclusion within the nomination of wet sclerophyll stands that were contiguous with rainforest was highly desirable, in order to reinforce the inter-relationships of the two forest types. The nominated sites also included a range of other communities including dry sclerophyll forest and woodland, and heathland. Where, at a particular site, these non-rainforest communities included features of high conservation interest, this was mentioned in the nomination (New South Wales Government 1984; Adam 1987). Kitching *et al.* (2010) said of the decision to nominate whole reserves, "This originally pragmatic decision has turned out to be prescient as both fundamental and more management-oriented ecologists moved from a more localized viewpoint to a landscape perspective." I would also suggest that in view of the argument about the geological history of rainforest presented in the nomination, it was also an appropriate approach, although perhaps one not fully expressed in the nomination as presented to the World Heritage Committee. This argument was that, contrary to previously prevailing paradigms, rainforests had been the predominant vegetation over most of the continent prior to the drying of the centre of the continent which started in the Miocene, and that extensive development of sclerophyll was, geologically, a recent phenomenon. Inclusion of the sclerophyll vegetation within the nominated reserves (Fig. 2a, b) thus provided a clear illustration of both the old (rainforest) and the (comparatively) new (the sclerophyll vegetation). This argument would now be more nuanced to reflect the occurrence of sclerophyll elements in the fossil record in nutrient poor sites from the early Cretaceous (Carpenter *et al.* 2016)

In preparing the nomination there was no restriction on eligibility of the sites to be considered. Choice was not restricted to areas included in the 1982 Rainforest Decision – any reserve containing rainforest might have been included if it could be demonstrated that the rainforest was of outstanding universal value.

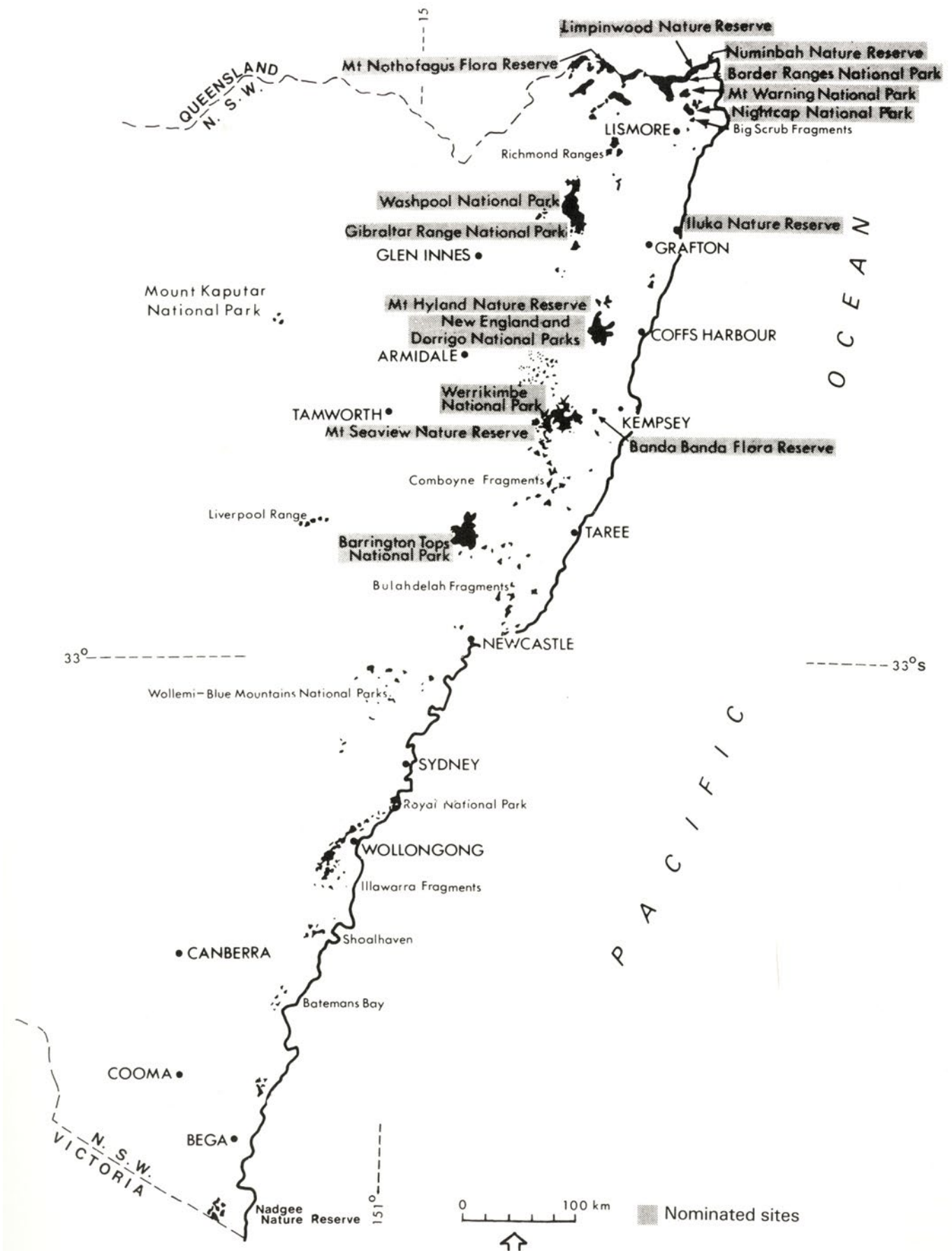


Fig. 1: The distribution of the nominated sites (with the exclusion of Mount Dromedary). From Adam (1987) – reproduced with permission of OEH.

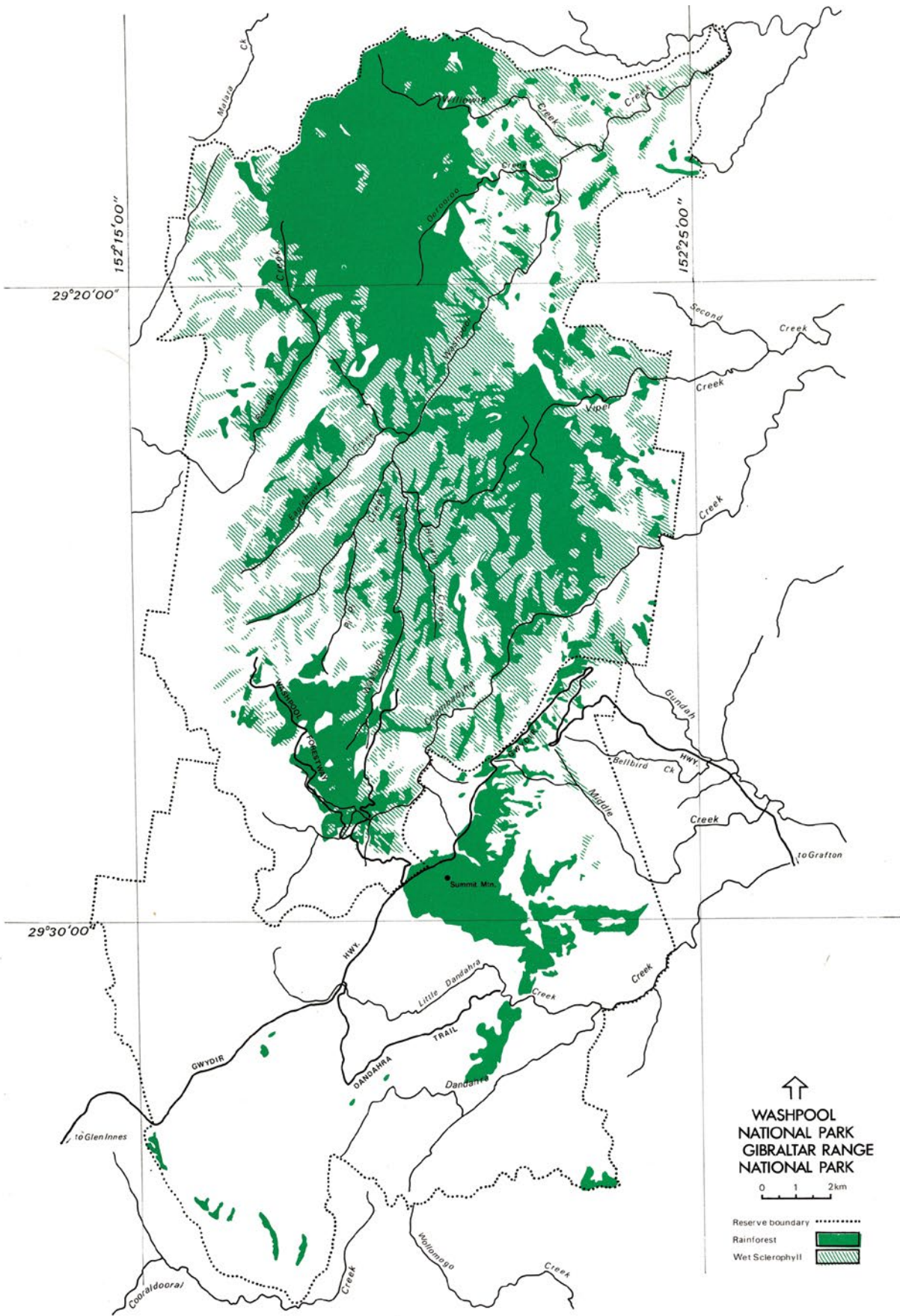


Fig. 2a: Map of Washpool National Park showing the relative extent of rainforest and wet sclerophyll forest. (Map was part of the nomination document and was included within Adam (1987) – reproduced with permission of OEH).

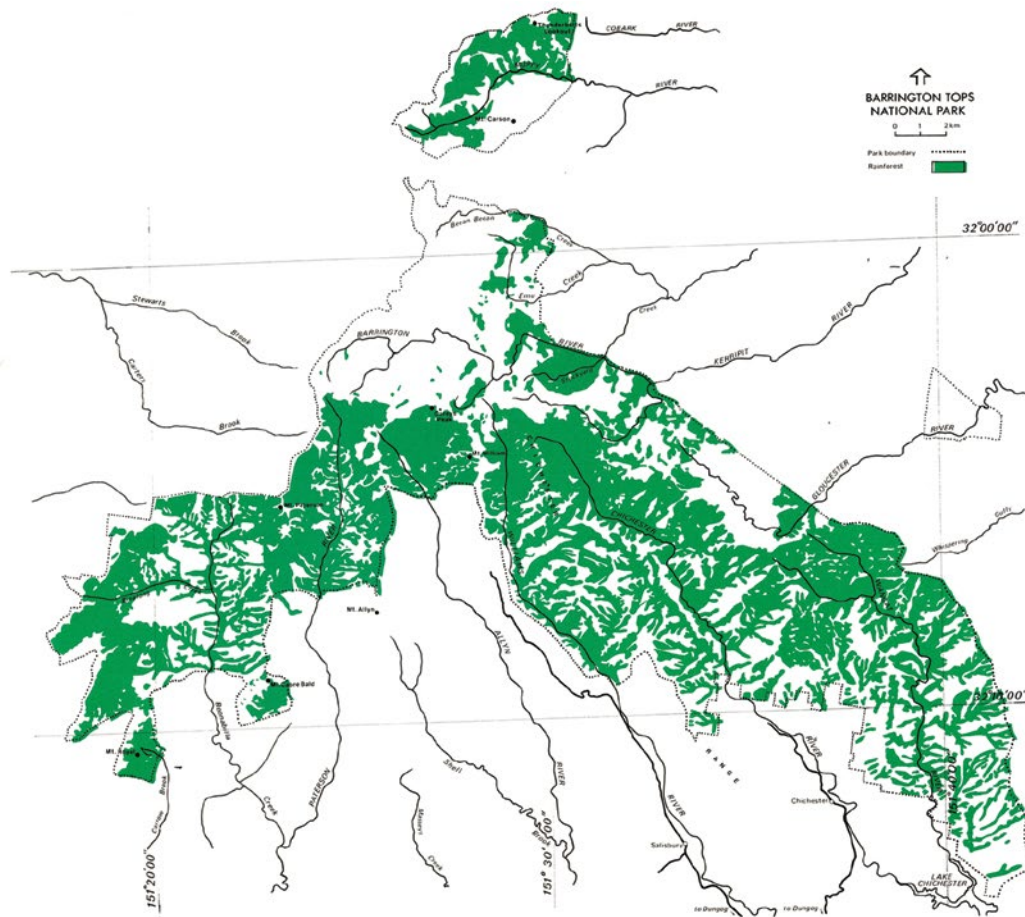


Fig. 2b: Map of Barrington Tops National Park showing the relative extent of rainforest and wet sclerophyll forest. (Map was part of the nomination document and was included within Adam (1987) – reproduced with permission of OEH).

“The sites included within the nomination were chosen so that they were:

- outstanding examples of the major rainforest types in NSW;
- sites in which rainforest forms a large portion of the total vegetation cover;
- rainforest stands which were sufficiently large and appropriately buffered by surrounding vegetation for the long-term integrity of their vegetation to be assured;
- representative of the major regional centres of rainforest present at the time of European settlement; (there is reason to believe that these areas have acted as refugia during periods of adverse climatic conditions, which gives them great biogeographic and evolutionary significance. As a result of clearing during the last 200 years, it is not possible for all of these areas to be included in the nomination. In the north-east of the state the extensive lowland rainforest that comprised the Big Scrub, and which was amongst the largest stands of subtropical rainforest in the world, has been reduced to a very few small fragments. Further south, the rainforests

on the Comboyne and Bulga plateaux have been virtually completely cleared. In the Illawarra, much rainforest has been cleared, and although extensive areas remain on the escarpment there would be questions about integrity given underground mining in the area.)

- Sites with other features of international or national significance in addition to the rainforests (outstanding geological or scenic features, or particularly fine examples of sclerophyll communities.)” (From Adam 1987, page 46).

What is outstanding universal value and what evidence would be required to establish it?

Notwithstanding that there are very many more cultural sites than natural sites on the World Heritage List, it does seem to me that the concept of outstanding universal value presents more difficulties for cultural sites than it does in the natural environment. In the natural environment we have some unifying themes related to biodiversity, species richness and particular charismatic, and often rare, species. Culture by its very nature differs amongst different people. From an outside perspective it is possible

to see that something has outstanding value, that this is universal may be more difficult to justify. The complex of timber buildings making up Bryggen (Fig. 3a, b) in the Norwegian city of Bergen are an important part of the legacy of the Hanseatic League, the powerful mediaeval trading group in northern Europe, and are included on the World Heritage list as a cultural site. Although the buildings are attractive, historically interesting in terms of construction and design, and to many tourists probably quaint, are the values represented in the property part of the heritage of non-Europeans? As we are currently witnessing in the Middle East, destruction of heritage is an important aspect of the widespread civil war in Syria, and similar destruction took place a few years ago in Afghanistan. This destruction is widely seen in the West as a loss of cultural artefacts and places which are of outstanding value to the whole world. This perception is clearly not held by at least one faction of the local community. In fact, throughout history, destruction, or seizing possession of, cultural places and objects has been an inherent part of warfare. Destroying culture destroys people's sense of belonging. Many sites on the World Heritage List themselves demonstrate the importance through history of the destruction of culture (for example the ruins of Fountains Abbey in Yorkshire – reduced from their intact state during the reign of Henry VIII. The ruins are greatly valued not only for their historical importance but because the ruins set in their landscape are regarded as visually important – and no one would argue they ought to be restored to their original condition.)

Destruction of heritage sites is now regarded as a war crime under international law. Whether there will ever be a case mounted to seek recompense for damage to natural heritage sites remains to be seen. Damage to the natural environment in war and civil war can be extensive, with long-term consequences (as for example with the destruction of vegetation using Agent Orange in the Vietnam War).

Over the years the IUCN has developed guidelines for production of nominations, with increasing detail as to how criteria are to be interpreted. Interpretation of what is outstanding universal value nevertheless remains, at least partly, subjective, but can be guided by precedent – what were judged to be outstanding universal values in previous successful nominations.

The intention of the IUCN and the World Heritage Committee is that sites of outstanding universal value on particular criteria be very much the *crème de la crème* (Fig. 4, from IUCN 2008). That a site is not judged to be of outstanding universal value should not be interpreted as implying the site is of low or no conservation value. In an era when the main conservation paradigm places high importance on biodiversity and landscape scale connectivity, it is the whole jigsaw which should be considered and valuing any particular piece of the jigsaw



Fig. 3a.: Bryggen, a World Heritage site in the heart of Bergen, Norway. A historic precinct of wooden buildings dating back to the Hanseatic League. Photo P.Adam

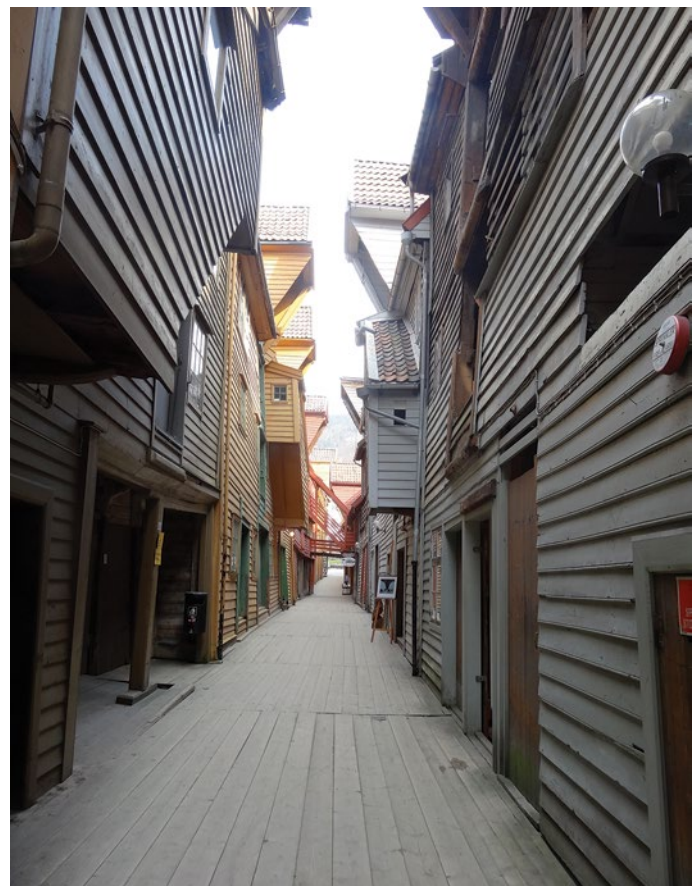


Fig. 3b: Part of the network of lanes within Bryggen, Photo P.Adam

above others is not necessarily useful in achieving overall conservation objectives.

Although there are four criteria against which nominations for natural sites are assessed, it seems to me that there is potential for overlap among several criteria. I would suggest that a site nominated under criterion viii) (with significant geomorphic or physiographic features) is, because of the presence of those features, *ipso facto* likely to meet criterion vii) (superlative natural phenomena or areas of exceptional

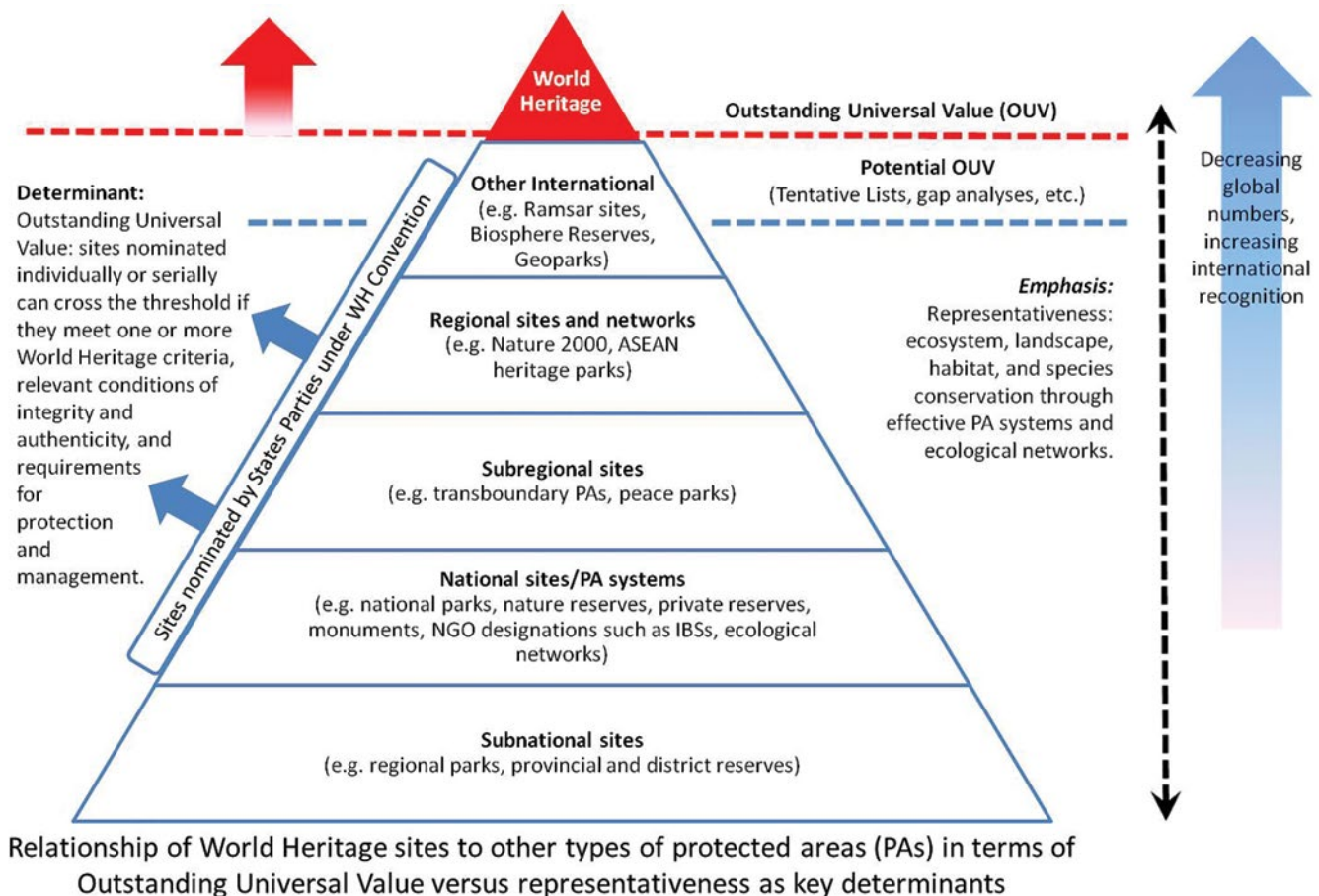


Fig. 4: World heritage sites as the rarest category of protected areas. Redrawn from Magin and Chape (2004).

natural beauty and aesthetic importance). Similarly, ecological communities are part of biodiversity, so that a site satisfying criterion ix) (ongoing ecological and biological processes) is also likely to satisfy criterion x) (importance of conservation of biological diversity). Indeed, IUCN (2008) concedes that there has been substantial confusion in nominations between what is appropriately included under ix) or x). Criteria vii) and x) might also encourage a Guinness Book of Records approach (the tallest cliff, the largest canyon, the longest species list). Peter Hitchcock (Personal communication 2017) considers that Criterion ix) stresses evidence of ecological and evolutionary processes, but this does not totally resolve the possible overlap. (In NSW legislation biodiversity values included the ecological processes and services provided by biodiversity.)

Criterion vii), from my perspective, can be particularly problematic. Beauty is often in the eyes of the beholder, and the previous experience and cultural background of an assessor might influence the conclusions reached. In that respect, the Australian landscape may have been too different to be appreciated by assessors brought up in recently glaciated terrains.

The IUCN has placed considerable effort into developing and explaining criteria for the application of Criterion vii

(Mitchell, 2013), and, careful study of that text and consideration of particular cases as precedence, enables understanding of the process – but in any particular case minds might still differ as to the appropriate outcome. Assessors are discouraged from recommending listing on the natural beauty aspect of (vii) with the result that in recent times no areas have been listed on natural beauty alone – because of the subjectivity. Listing on the ‘outstanding natural phenomenon’ aspect is more common because it can be more easily recognised. (Personal communication, Peter Hitchcock 2017.)

The criteria under which a particular site was nominated to be included on the World Heritage List do not always appear to be the most obvious. However, merely on the basis of the summary documentation it is not possible to know whether or not the nominating party originally proposed additional criteria which did not survive review.

Macquarie Island was included in Australia’s successful nomination of three sub Antarctic islands – Macquarie, Heard and McDonald. Australia had unsuccessfully nominated Macquarie Island some years earlier, in a nomination primarily based on the animal life of the island.

The successful nomination was focused on criterion

vii) – with the superlative natural phenomena being the numbers of penguins and seals, and the topography – and criterion viii) (and this seems to have carried the greatest weight) – its geological uniqueness as being the only place on earth where rocks from the Earth's mantle are exposed above sea level.

Not having been part of the process, it seems to me, as an outside observer, that the assemblage of birds and marine mammals might also have qualified under criterion x) – a criterion which could also have accommodated the significance of the endemic flora (the vascular flora of subantarctic islands is small, but the proportion of endemic species is high). (Peter Hitchcock has suggested to me (Personal communication 2017) “that as qualification against each criterion is considered of equal value, there is a tendency to avoid using one feature to qualify against multiple criteria. The large penguin aggregations (not confined to these islands) could perhaps qualify against (vii) and (x). I presume someone has decided that in a global context (vii) takes precedence.”)

Building the case for a serial listing

The New South Wales rainforest nomination was the first serial nomination for terrestrial sites and thus it was breaking new ground. There were no earlier nominations which could be looked at to provide guidance as to how the case for New South Wales rainforests could be developed.

New South Wales has an exceptional range of rainforest types, whose distribution exhibits both altitudinal and latitudinal gradients. One of the reasons why it was necessary to nominate a number of sites was to capture this range of variation in present-day community composition. The variation can be read as illustrating how community composition varies in response to climate, topography and geology. It can also be read as a reflection of the historical development of rainforest in Australia as the continent drifted northward from its high latitude position when it was part of the united Gondwana to its current position with its leading margin well into the tropics.

The timing of the nomination was fortuitous, in that it came after continental drift had become firmly established as the model for understanding global geology and after the *annus mirabilis* of 1981 when a number of publications synthesised biogeography and ecology with geological evidence to arrive at a new understanding of the development of Australia's ecosystems. For rainforest, the work of Len Webb was crucial to this new picture. Webb had been Australia's leading rainforest ecologist for many years, had revealed the complexity of the variation in structure, physiology in species composition of rainforests in the continent (see Webb 1959, 1968, 1978, Webb *et al.* 1970) and provided the basis for the synthesis (Webb and Tracey 1981, Webb *et al.* 1984). Analysis of the fossil record of Australian rainforest provided evidence to the

changing distribution and composition of rainforest over millions of years (Martin 1978, 1981, 1984). The fossil record, both micro fossils and macro fossil of rainforest plants had been known for decades, but it was not until the late 1970s and early 1980s that it was accepted that the evidence required the conventional wisdom that rainforest was recent and invasive, and that the predominant sclerophyll and arid zone vegetation was ancient, be reversed. Australia indeed has ancient rocks and soils, but the poet A. D. Hope's characterisation of Australia as 'The Last of Lands' does not appropriately apply to much of the continent's vegetation.

Although the temperate and subtropical rainforest are now regarded as having ancient roots in Australia, and extensive dominance by sclerophyll vegetation is more recent, the geological history of Australia supported the conclusion that the taxa making up the new vegetation nevertheless had their ancestry in Gondwana, this was supported by the large numbers of shared higher taxa between Southern Africa, Australia and South America. The concept of an ancestral pan-Gondwanan biota which underwent differentiation as the southern continents separated is generally supported by a range of evidence, but more recent findings indicate the need for some fine tuning as there is strong evidence for continued interchange between the components of former Gondwana long after they were widely separated (for example Weston 2014), although the mechanisms of dispersal and establishment are not yet known.

Acceptance that rainforest was once much more extensive across the continent has major implications for how the fauna is considered. While there is evidence for some comparatively recent invasion of Australia amongst rodents and bats, the majority of the terrestrial fauna has evolved either in the greater united Gondwana or, after separation of the continents, within Australia. This evolution must therefore have commenced within rainforest (or a least forest vegetation much more mesic than the currently prevailing sclerophyll communities – although consistent with the idea that sclerophylly was initially a suite of adaptations to low nutrient conditions there are fossil records of leaves with sclerophyll features from before the onset of widespread drying of the continent), and at higher latitudes, with greater variation in day lengths and temperatures between summer and winter.

In the subtropical and temperate rainforests included in the World Heritage nomination there are, today, few vertebrates which are rainforest specialists, although there is a number of species found mainly on the margins of rainforest. This is a major contrast with the Wet Tropics in which there is a number of rainforest specialist mammals and birds. The most likely explanation is that, even during the drier periods, the Wet Tropics had larger areas of rainforest which could support a great diversity of species than the refugial areas of subtropical and temperate rainforest. (The Wet Tropics also have a richer flora,

consistent both with the greater area of rainforest both at present and during cooler dry periods.)

A major paradigm shift that has occurred since the 1980s is the recognition that Australia was the original centre for evolution and diversification of songbirds (Low 2014). Australian rainforests as the global cradle of songbird evolution would make Australian rainforest of global significance and potentially of outstanding universal value. If that had been known in 1984 it would certainly have featured within the nomination, and the observations about the occurrence of primitive bird species (such as lyrebirds and bristlebirds) would have been given greater weight. However, the evidence would not have allowed us to claim that particular sites had, many millions of years ago, been key to the evolution of birds. The Australian avifauna today has a very large number of honeyeater species, which are important pollinators in sclerophyll vegetation. In New South Wales rainforests today there are no specialist rainforest honeyeaters, a curious lack. The major pollinators in NSW rainforests, at least for woody species, are generalist flower visiting insects (Williams and Adam 2010).

A linking narrative is also very obviously displayed in the landscape in the form of the Great Escarpment and remnant volcanoes. The Great Escarpment is the major landscape feature along much of the east coast of Australia (Ollier 1982, 2010). The Great Escarpment lies to the east of the Continental Divide. The term Great Dividing Range frequently appears in literature, but it is misleading; the Continental Divide is for the most part a visually inconspicuous feature in the landscape (Ollier 2010). The Divide is real enough, and its occurrence so close to the east coast is extremely important to understanding the ecology and hydrology of the continent. However, the Divide does not form an obvious ridge in a rugged mountain range. What appears, when viewed from the coast, as a mountain range forming the western horizon is the Great Escarpment. Approaching the Great Escarpment from the West, it is a precipitous fall marking the edge of the Tablelands.

There has long been controversy and debate about the geological origin of the Great Escarpment. The recent totally new model advanced by Müller *et al.* (2016) addresses the problems of previous explanations. This model proposes that the formation of the escarpment was driven by convection in the Earth's mantle resulting in two separate dynamic uplift events. If, as initial responses suggest, this model is accepted, then it would add to the World Heritage values by providing an outstanding example of an important geological process.

The existence of the Great Escarpment has been a major factor in the survival of rainforest during the climatic oscillations of the last few million years of Earth's geological history, with the climate varying from dry periods (the ice ages – although, with the exception of the

limited areas in the Alps and Tasmania, glaciation and snow lie were not a feature of eastern Australia) and wet interglacials like the present. The steep wall of the Great Escarpment is a major barrier to rain bearing clouds, and even during climatically dry intervals, orographic rain along the Great Escarpment would have provided wetter conditions suitable for the survival of rainforests. The cycles of expansion of rainforest during the interglacial and retreat to refugia during the glacial periods, would have caused sifting of the biota; not all species would have been able to adjust fast enough to keep up with the changing environment. Although there will have been local, and probably some total, extinctions amongst the biota because of the changing climate, the existence of locally favourable conditions along the Escarpment provided refugia for the rainforest biome.

The nomination appears to have been the first occasion when the survival of species and ecosystems was linked to the existence of the Great Escarpment.

As the Australian continental plate has moved northwards, its eastern margin has moved over an underlying hotspot with the consequence that there has been a series of major volcanic eruptions, the oldest to the north and the youngest in what is now Victoria.

These volcanic episodes will have caused major disturbance to vegetation at the time of eruption and have left a legacy of residual landforms and krasnozems soils derived from the weathering of volcanic rock. In the Australian context of widespread ancient, deeply weathered, now extremely nutrient poor soils, the areas of volcanic derived soils stand out as conspicuous exceptions to the norm. Globally, most rainforests are not restricted to nutrient rich soils, as much of the nutrient capital in the ecosystem at any one time is within the vegetation and very efficient tight nutrient cycling is necessary for survival, such that the clearing of the forest does not necessarily result in agriculturally productive land. However, the relatively high nutrient status of some rainforest soils in New South Wales, in conjunction with the climatic advantages of Great Escarpment, may have conferred greater resilience when rainforest was restricted to glacial period refugia.

The landforms produced by the erosion of the volcanoes are dramatic landscape features which, to many Australian eyes, are outstanding, but this view was not one endorsed by the assessors of the nomination. The caldera of the Mount Warning volcano is one of the largest on earth, the scale of which can only really be comprehended in satellite imagery.

The individual sites

While a big picture of subtropical and temperate rainforest in New South Wales being significant biomes of high value at the present time, as well as illustrating the development of the biomes over geological time, provides a background

to the nomination, it was still necessary to document the values of the individual sites.

Although there were many notes published in early volumes of the *Proceedings of the Linnean Society of New South Wales* and *Transactions of the Royal Society of New South Wales*, reporting on collecting trips to rainforest localities and commenting on species of interest these did not (nor were ever intended to be) a comprehensive coverage of the state's rainforest.

In the 20th century there had been a limited number of ecological studies, and although visits to rainforest were a frequent feature of field courses, rainforests had not been a major focus for research.

However, there were comprehensive botanical survey data available in the form of the internal reports in the NSW National Parks and Wildlife Service prepared by Alex Floyd who had an encyclopaedic knowledge, based on years of field experience of New South Wales rainforests. Alex was a forester, who at the suggestion of the Commissioner for Forests, Jack Henry, had been seconded to the NSW National Parks and Wildlife Service to conduct a comprehensive survey and assessment of rainforests throughout NSW (Personal communication, Peter Hitchcock 2017). Relationships between the NSW National Parks and Wildlife Service and the Forestry Commission were constructive at that time, but under later Commissioners unfortunately became extremely adversarial. Much of the information for these reports was subsequently synthesised and made available to a wider audience in the publication of the two volumes of Floyd (1990) and their accompanying microfiche (at the time microfiche was seen as a means of economically making large volumes of primary data available – the technology has now been surpassed by digital methods and finding a microfiche reader is a difficult task – although from a very long-term archival perspective, microfiche may provide a safer means of ensuring data survival than reliance on digital methods where recovery of data requires both appropriate hardware and the necessary software).

Without the Floyd reports it would have been impossible to have prepared the nomination which was submitted. Alex's contribution to conservation in NSW has been immense.

Availability of data for other taxa was limited. There had been some surveys which allowed species lists to be presented, but it was not always possible to link particular species to the rainforest component of sites. It is also appropriate to recall that the early 1980s were the time when acoustic technology for locating and identifying bats was in its infancy. Bats represent a substantial component of the mammal fauna of Australia, and many bats species utilise rainforest as at least part of their range. Since the time of the nomination there have been substantial discoveries and range extensions reported for many bat

species – any account produced in the early 1980s would have presented a very incomplete picture.

The nomination did draw attention to a number of features of zoological interest within the sites, not necessarily restricted to the rainforest component. For example, the occurrence in rainforests of a number of freshwater crayfish species, several of which were restricted to particular catchments, was discussed. The importance of rivers as habitats within the rainforest was also stressed. One species which was highlighted, and illustrated in the nomination document, was *Pseudomys oralis*, the Hastings River Mouse, which had recently been rediscovered, and for which one of its major occurrences was around the upper Forbes River in the Hastings group of sites – not in, but close to, rainforest. Another species to which attention was drawn was the Rufous Scrubbird (*Atrichornis rufescens*). At the time species numbers were very low and some feared that extinction might be imminent. The population size has increased considerably but the species is still regarded as threatened because of the restricted and fragmented habitat.

The resulting nomination covered a range of sites, the majority between the Queensland border and Barrington Tops, with a southern outlier at Mount Dromedary on the south coast. Mount Dromedary supports one of the best stands of *Eucryphia moorei* (pinkwood) cool temperate rainforest in the State. This forest type provides a link between the cool temperate rainforests of Victoria and Tasmania and those of New South Wales and southern Queensland. The northern limit of *E. moorei* is near Robertson, but the Mount Dromedary stand more clearly satisfied the criteria set for inclusion in the nomination.

During the nomination assessment process, the Mount Dromedary site was, by agreement between the field assessor and the New South Wales and Commonwealth governments, dropped, primarily on the basis that the disjunction between Mount Dromedary and Barrington Tops was too large for Mount Dromedary to be considered part of the same nomination.

While the distance was several hundred kilometres, the distance alone would not rule out the possibility of intermittent but continuing connection given what we now know about long-distance movements of flying-foxes, also known as fruit bats, and rainforest birds. More importantly *E. moorei* dominates a distinctly different type of rainforest, and exclusion meant that the objective of including all major rainforest types in the State was not achieved.

Another matter which was of concern to the assessor was the inclusion of Iluka Nature Reserve, which had been proposed as the largest and richest littoral rainforest site in the state on the recommendation of Alex Floyd. Littoral rainforest did not feature in the Rainforest Decision. Loss of littoral rainforest had been one of the concerns in the

long fight during from the late 1960s to the early 1980s to halt mineral sands mining in New South Wales, but it was not raised as a major issue by conservation groups during the rainforest campaigns of the early 1980s. There was a degree of surprise when it was learnt that Iluka was part of the nomination.

Littoral rainforest occurs in two situations – on coastal headlands where, in exposed locations, it may have a dense wind-pruned canopy only 1–2 m tall, and on sand dunes. It has a distinct species composition and, even before sand mining, it was likely to have occupied only a limited and highly fragmented area. It occupies an environment seemingly inimical to rainforest development – often very well-drained, expose to high winds and salt spray, and experiencing rainfall much lower than well-developed rainforest further inland.

It is a very poorly studied rainforest type, and although what are structurally and floristically littoral rainforest stands are found widely on Indo-Pacific shores, its occurrence is frequently ignored in regional accounts of rainforest. The fragmented nature of littoral rainforest and its proximity to coastal development render this forest type particularly vulnerable to weed invasion. Of the sites nominated, Iluka was certainly the one where threats to its long-term integrity from invasive plants were most obvious. Where littoral rainforest fits into the story of the evolution of rainforest, either in Australia or globally, is not clear, but those preparing the nomination were nevertheless comfortable in arguing that it is a distinctive rainforest type that should be included, and New South Wales has consistently maintained its position even though, in subsequent iterations and amendments to the listing, there has been continuing concern expressed by IUCN about its inclusion. One of the arguments which had been raised during this ongoing debate is that with the inclusion of Fraser Island on the World Heritage List there was now a much better example of rainforest on sand making it unnecessary to retain Iluka. This argument fails to recognise the substantial differences between the two situations. The extensive *Syncarpia hillii* and *Lophostemon confertus* rainforest of Fraser Island is a remarkable and unique forest type. It occurs on sand, and on an island, but it is the world's largest sand island and the forests are distant from the extreme maritime influence experienced in littoral rainforest. Littoral rainforest elements occur close to the island shoreline, but the inland forest of the island is not littoral rainforest. This forest type certainly deserves recognition on the World Heritage List, but it cannot be considered as a substitute for Iluka.

The nomination advanced by New South Wales to the Commonwealth argued that the sites collectively satisfied all four criteria for listing of natural sites, including what is now criterion vii) (superlative natural phenomena, areas of exceptional natural beauty). Inclusion on the basis of this criterion was discussed on page 143 of the nomination (New South Wales Government 1984), as

well as in Adam (1987). The striking scenic values were also very apparent in the video which accompanied the nomination. Nevertheless, the nomination which went forward to the World Heritage Committee omitted this ground. Cavanaugh *et al.* (2010) suggest that the predominance of botanists on the working group may have been at least partly responsible (but I plead not guilty!). It is also suggested by Cavanaugh *et al.* (2010) that 'the absence of a glacier might have had something to do with it'. (Peter Hitchcock (Personal communication 2017) assures me that this was definitely not the case.)

The nomination has been criticised on a number of grounds. The absence of a zoological story is one of them. In that instance there may be more substance in arguing botanical bias, but I would maintain that the state of knowledge in the early 1980s was not conducive to a convincing narrative. As part of the argument in favour of listing was the outstanding universal value of rainforest as a biome, and the nature of the biome could be characterised by the detailed data for the flora, then the fauna were implicitly included as an essential component of the biome.

Dowling *et al.* (2014) have recently suggested that it was unfortunate that the nomination did not discuss more fully the importance of bryophytes. The cover of the nomination (New South Wales Government 1984) and of Adam (1987) featured the same atmospheric photograph of cool temperate rainforest with pendant skeins of the moss *Papillaria* prominent in the image (Fig. 5). Occurrence of epiphytic mosses in the family Meteoriaceae (to which *Papillaria* belongs) was regarded by Schimper (1903) as one of the defining features of rainforest.

Rainforest are often rich in bryophytes which provide a considerable component of the biodiversity of the ecosystem. Bryophytes are also likely to be important in the hydrology of rainforest, including, in the case of the pendant Meteoriaceae, being involved in fog stripping.

However, in 1984, there was little information available about bryophyte presence (and nothing about ecological function) for the majority of the nominated sites, with the exception of those in the Hastings group. Even today the situation is not much improved. If we had a substantial body of information for all the sites it would be difficult to know whether this constituted outstanding universal value, given the paucity of information from most rainforests around the world. Inclusion of more data for a range of taxa could strengthen the case for outstanding universal value but will not add to the number of criteria satisfied.

The same could also be said of the fungi, despite their importance for ecosystem function. Some of the more striking species found in the nominated sites were illustrated in the nomination and accompanying video – more for their 'wow' factor than to support an argument.

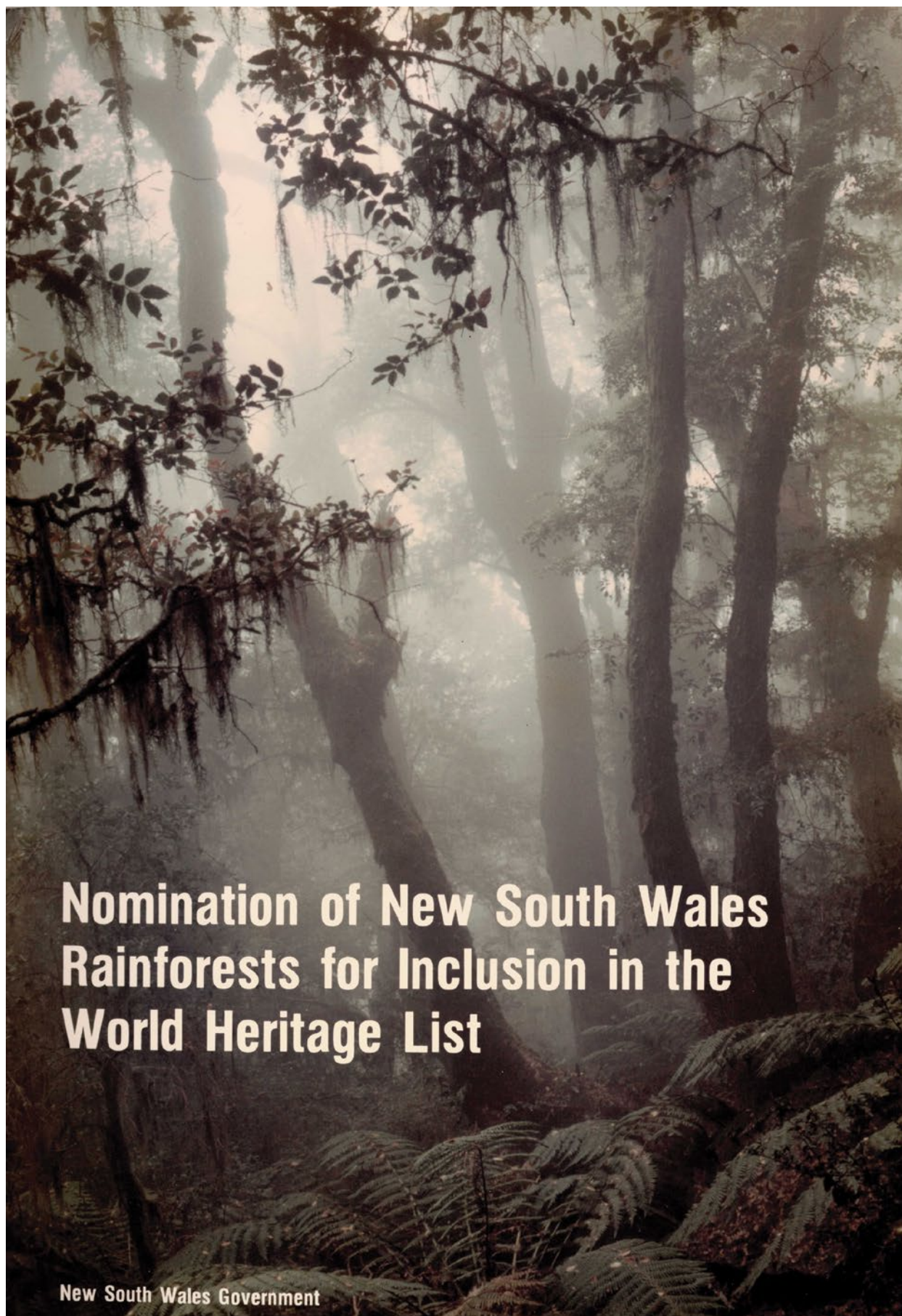


Fig. 5: The cover of the nomination document *Nothofagus* cool temperate rainforest, with trees festooned with the moss *Papillaria*. Photo by Ederic Slater; reproduced with permission from OEH.

It was not possible in 1984 to comprehensively document the fungi in the sites, the longest species list was for the Hastings group, but this was made up of species fruiting at a limited time of year (late winter, early spring) and even for this period the lists were incomplete. Again, in terms of outstanding universal value, comparative data from rainforests overseas are limited.

However, the nomination did note, both for fungi and bryophytes, that a number of taxa in the nominated sites had clear Gondwanan distribution patterns.

Somerville (2005 page 7) expressed concern that, regrettably, “The official nomination to UNESCO virtually ignores the long hard fight the preservation of rainforest giving the quite erroneous impression that both State and Federal governments were sympathetic to the idea of preservation”. While I would agree that those involved in the rainforest battles deserve recognition and praise for their insights and efforts, I am not sure a nomination is the place for government to ‘fess up’ about its murky past. Australian conservation groups in the 1970s and 1980s developed new and effective methods of conveying their message to the broader public. 1984 was too close to events for the significance of this to be recognised when the nomination was prepared. Potentially there is a case to be made that events at Terania Creek had global influence on the conservation movement, and that thus they could be included in a nomination under criterion vi). While it would be an interesting exercise to pursue this, my feeling is that it would be doubtful that it would be supported by assessors. The history of the development of conservation theory and practice which can be associated with particular key sites is not something which has been acknowledged in other nominations. Terania Creek could probably meet the criteria for National Heritage listing, but this remains to be tested.

Outcomes

The listing of six groups of sites containing a total of 16 parks and reserves (Fig. 1) under the name of Australian East Coast Temperate and Subtropical Rainforest Parks occurred in late 1986. The name was proposed by the IUCN, which was anxious to leave avenues open for inclusion of sites in Queensland and felt that New South Wales Rainforest as a name would be limiting.

The official announcement and plaque unveiling took place in Werrikimbe National Park (part of the Hastings group of sites). This was a fairly low-key (almost an anti-climax) event, and ironically, the unveiling was performed by the then Premier Barry Unsworth, who in 1982 had been part of the right-wing faction of the Labor Party opposed to the rainforest decision (Somerville 2005; Turvey 2006).

The election of the Goss Labor government in Queensland in 1989 provided the opportunity to nominate extensions to the listing in southern Queensland. The preparation of the revised nomination was a much more open process than for the original New South Wales nomination, and involved open debate about the inclusion of a number of particular sites.

A nomination for what was renamed as the Central Eastern Rainforests of Australia was submitted in 1992. The IUCN evaluation recommended a number of changes and suggested additional areas to be added in both New South Wales and Queensland (it also formally requested deletion of Iluka), and proposed a name change to Rainforests of Central Eastern Australia. One of the suggested additions in Queensland was the Bunya Mountains National Park. There was substantial opposition and fierce lobbying of the Queensland Government from recreational users and bodies such as the Cattlemen’s Union. The Queensland Government determined to refuse the request for inclusion of Bunya Mountains.

A reworked nomination was accepted by the World Heritage Committee in 1994, under yet another name – Central Eastern Rainforest Reserves of Australia (CERRA) (Cavanaugh *et al.* 2010).

Yet a further name change was approved in 2007, and the listed property became the Gondwanan Rainforests of Australia.

If the proposal for listing New South Wales rainforests had emerged, not in 1984, but 30 years later in 2014, the process for making a nomination would have been very different. It would not have been possible for the Premier to announce an intent to nominate, and then present the Commonwealth with a fully worked document. Now the process is staged, and firstly the State would have to persuade the Commonwealth to add the property to the Tentative List – a list of properties which state parties are interested in nominating. Australia has not been good at systematic strategic planning to develop a tentative list – proposals still emerge without warning and without any consideration of broader context. Indeed, it has been the policy of successive Commonwealth Governments not to place areas on the Tentative List as proposed by the Convention, probably for political reasons. It is only with rule changes by WHC that requires placement on the Tentative List at least one year before a nomination is presented that has seen Tentative Listing by Australia but only of areas already agreed by Commonwealth and State for nomination at the first opportunity.

Almost all State Parties to the Convention meet the intent of the Convention by nominating areas assessed as being likely to be of outstanding universal value to the Tentative List even when nomination is not planned in the foreseeable future. Australia has resisted

calls by WHC to submit a Tentative List and presently has only two nominations to the Tentative List, both being proposed extensions to existing World Heritage Listed sites (Gondwana Rainforests and Great Sandy). Even a country like Papua New Guinea has a total of 7 large sites on the Tentative List. (Peter Hitchcock, Personal communication, 2017.)

The preparation of the 1984 nomination was not a secret; it had been an election promise. However, the process was not public and there was no public consultation (or indeed much interagency consultation). Given the short timeframe, an extensive consultative process would have been impossible, and if it had occurred would have been likely to have set numerous hares running, and provoked heated media comment. However, today there is an expectation that there would be broad consultation and the World Heritage Committee would need evidence that this had occurred at both Tentative List and nomination stage. There will also be an expectation of wider consideration of social issues attendant on a listing.

If these procedures had applied in 1984, so soon after the rainforest decision and with the timber industry and rural communities still uncertain about their futures, I doubt a nomination would have left our shores.

Did the Rainforest Decision and the World Heritage listing secure the prospects of long term survival of the range of rainforest types and individual rainforest species? My view would be that the job was half done. For some types of rainforest the outcome was very good – virtually all cool temperate *Nothofagus moorei* forest is both conserved and included in a World Heritage site. (Heenan and Smitsen (2013) have proposed that *Nothofagus sensu lato* be split into four genera. I would strongly support the argument advanced by Hill *et al.* (2015) that the case for this change is weak and that the proposed genera not be adopted.) The status of warm temperate coachwood forest was greatly improved. However, there are many types of rainforest, and many rainforest species, which remained outside the reserve system. Some general protection was offered to littoral rainforest by the introduction of NSW State Environmental Planning Policy (SEPP) 26, but continued degradation from weed invasion, greater public use, and attrition of edges has continued. The advent of the NSW *Threatened Species Conservation Act 1995* permitted recognition of the threatened status of many rainforest species, and the listing of much lowland rainforest on private land as Endangered Ecological Communities, but recognition is often more symbolic than real as it is difficult to enforce legislation given lack of access to private land and the limited staff resources available.

At the World Heritage level I would contend that if the idea was to recognise the importance and

distinctiveness of Australian rainforest on a global scale, there is still work to be done.

In eastern Australia there is a unique opportunity to sample a transect of rainforest variation several thousand kilometres long. Key sites in this transect have been afforded World Heritage listing, but there are major gaps.

Rainforest is a significant component of the Tasmanian Wilderness listing. Important rainforest areas are conserved within the Greater Blue Mountains World Heritage Area, and north of the Hunter, the chain of sites in the Gondwanan Rainforest property extend up into southern Queensland. However, south of the Greater Blue Mountains World Heritage area, and north of the Gondwanan rainforests, there are large gaps.

I suggest that there are opportunities to include areas of rainforest in Victoria (such as, but not limited to, those on the Errinundra Plateau). Since Mount Dromedary was not accepted for listing, there has been remarkably little work on rainforest in southern New South Wales. I still consider Mount Dromedary as a contender for listing but other opportunities should be considered, and, in particular, associated areas of ‘wet sclerophyll forest’ (but correctly identified as a form of rainforest) should be assessed for nomination.

North of the Gondwanan Rainforests there is a very large gap to the Wet Tropics World Heritage Area. There are some rainforest stands in this gap, as for example at Eungella, and Mount Elliot near Townsville. As part of a broader serial listing I would suggest that some of these be evaluated for potential World Heritage Listing. North of the Wet Tropics areas, such as the Iron Range and McIlwraith Range, include important rainforests which could be considered for inclusion. There has been work preparatory to a potential Cape York nomination underway for many years, but with continuing lack of enthusiasm by both the Commonwealth and Queensland governments prospects for a successful nomination are not rosy. The Papua New Guinea government has included on the tentative list the Trans Fly savanna. A transnational nomination of both the Trans Fly and Cape York savannas would be an exciting prospect, but again one not likely to eventuate in the foreseeable future.

The World Heritage listing of the Gondwanan Rainforest and the Wet Tropics has helped raise the profile of rainforest and rainforest conservation within Australia and has been important in promoting ecotourism. It is also raised the international profile of Australian rainforest, both in the field of science and more broadly.

Since the listing there has not been a major increase in research in subtropical and temperate rainforest, and for many taxa and for many ecological processes the state of knowledge is not greatly improved over the last 30 years. This is a great contrast to the situation in the Wet

Tropics where following World Heritage listing there was a substantial financial input from the Commonwealth including establishment of the Cooperative Research Centre for Tropical Rainforest Ecology and Management, which became a centre for rainforest research of world repute, and investment (at least for a period) in facilities such as a canopy crane. (The CRC was closed on 30 June 2006, after its funding was not renewed). Some of the findings from research in the Wet Tropics are applicable more widely and more generally, but the opportunities for exploring southern rainforests are also great but have, with few exceptions, not been progressed. Given the global rarity of subtropical and temperate rainforest the need for research in these forests is arguably greater than that for tropical rainforest. (Some statements about Australia having the only, or the most, subtropical rainforest do, however, need to be taken with a pinch of salt – but the major problem is that the existence of these ecosystems is frequently not acknowledged, so that it is difficult to determine where and how much remains elsewhere in the world).

It is not my intention in this contribution to revise or update the case for listing of New South Wales rainforests. If we were starting from scratch in 2016 I think the case would be stronger, as we have much more information available, both about individual sites and about the biogeographic significance in a global sense of Australian rainforests. What, 30 years ago, was a fairly simple argument about the development of Australian rainforests over geological time related to the evolution of flowering plants would now be somewhat more complex (Kooyman *et al.* 2014), but the argument which now could be made reinforces the case made in 1984. A masterly re-evaluation of the values of the individual properties and of the whole, using much improved data, has been presented by Hunter (2004).

The New South Wales nomination paved the way for greater consideration of serial nominations, including cross international border serial nominations, capturing particular themes. In this regard the nomination was a major landmark in the development of the World Heritage List.

The listing of the New South Wales rainforests gave them a greatly increased international recognition but also had consequences for the IUCN assessment process. The nomination set new standards for the extent of the documentation required for assessment, but more importantly set the standards for future serial listings¹.

¹ While the nomination set new standards it was, compared with previous examples, a much more substantial document. Concern was expressed that, as the proposed nomination document passed up the bureaucratic chain, it would be seen as daunting, and reading and digesting it would be time consuming, with a danger that the message would be lost. To address these concerns a short video was commissioned to convey and illustrate the essence of the nomination. This was produced in a very short time: there was no new video imagery, rather existing slides were utilised, accompanied by a script written by Peter Hitchcock. This video was never released for wider circulation, but a digital copy has been made and can be accessed at

The nomination is a case study for serial listings (Badman *et al.* 2008). This was an unexpected outcome, the process we followed, and the argument we developed, were pragmatic solutions to the challenge set by Neville Wran. It was clear that separate nominations of a large number of individual sites would have been unlikely to succeed, and only a few sites might, as stand-alone nominations, cleared the bar for listing. However, it was very clear to us that in a serial listing the whole was very much more than the sum of the parts, and that by considering all the sites a compelling story about the origin and diversity of NSW (and Australian) rainforests emerged.

The story as presented in the nomination was nevertheless not as immediately compelling as those involved in its preparation thought it was.

Peter Hitchcock (Personal communication 2017) recounts discussion with the IUCN assessor during the field mission to consider the nomination: “Up to this point in time, all World Heritage listings were of single contiguous tracts of protected area. During the IUCN field mission – at Dorrigo to be exact – the leader of the IUCN field mission, Dr. Jim Thorsell, advised us (Alex Floyd and myself – may have been another) that the nomination as presented would fail because it comprised so many separate ‘mountain top’ parcels of land, hitherto unprecedented for a single World Heritage site. Further, he advised therefore that the only way forward was to select the most important area and drop all other areas from consideration. This was a shock to both Alex and myself. I remember very clearly Alex, after he had finished his glass of milk, saying to Jim Thorsell ‘Isn’t the Galapagos Islands a World Heritage Area?’ whereupon Jim Thorsell waxed lyrical about how well qualified they were to meet World Heritage listing. Alex pounced by presenting to us the proposition that our rainforest protected areas were ‘land islands’ – our own Galapagos archipelago. Alex proceeded to produce examples to illustrate divergent evolution in the rainforest tree species – genetic/morphological differences from one ‘mountain top’ to another – analogous to the divergent evolution that Darwin had discovered between the islands of the Galapagos. (At that stage, only the terrestrial part of the Galapagos was listed, the marine matrix being a later addition.)

A part of Floyd’s case at the time was that the cool temperate rainforests (*Nothofagus*) were relicts of a once continuous forest in the times of Gondwana and had survived as mountain top refugial remnants during the warming and drying of the continent post breakup with Antarctica. These remnants collectively told a much more important story than one site in isolation.

This line of argument sparked a definite interest by Thorsell and over the next few days we continued to

elaborate on that concept. From my recollections, Jim Thorsell presented the 'Galapagos' concept to the IUCN World Heritage Panel and so was born the concept of serial nominations for natural World Heritage sites. Some years later I was faced with field assessment of the Sumatran Rainforest Heritage of Sumatra nomination as a three part serial nomination.

Serial nominations are now relatively common but there is always a debate about whether they are just a collection of bits and pieces or are truly related thematically or by process."

One of the most remarkable serial listings is in a cultural one, the Struve Geodetic Arc – which encompasses 10 nations and stretches from Hammerfest in Norway to the Black Sea. The Arc is a chain of survey triangulations, carried out between 1816 and 1855 by surveyors under the leadership of the astronomer Struve, which represented the first accurate measurement of a long segment of a meridian. The Arc originally had 265 main station points. The inscribed property on the World Heritage List includes 34 of the original station points. The marks take many different forms – mostly being relatively small structures or marks on rocks or masonry, but sometimes

consisting of cairns or specially constructed monuments. The importance to the history of science of the natural environment has not really been recognised in listings of natural sites. The Struve Geodetic Arc may provide a model in the future for serial listings of sites associated with such outstanding figures as Charles Darwin, or the father of taxonomy, Carl Linnaeus.

Coda

At the 1983 ALP NSW State Labor conference Neville Wran reflected: *"I know it was not everyone who thought it was a great thing to save the rainforest, but I make this prediction here today: when we are all dead and buried and our children's children are reflecting on what was the best thing the Labor government did in the 20th century, they will come up with the answer that we saved the rainforests."*

Few politicians then, and even fewer today, would (or could) make a similar statement. Despite the high profile in the community of environmental issues, the environmental portfolio is generally low in Cabinet ranking, and few leaders would make the delivery of environmental policy the keystone of their government, whatever might be said during election campaigns.

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References

ACE. 1972. *Pedder papers. Anatomy of a decision*. ACE, Melbourne.

Adam, P. 1987. *New South Wales rainforests. The nomination for the World Heritage List*. National Parks and Wildlife Service, Sydney.

Adam, P. 1992. *Australian rainforests*. Oxford University Press, Oxford.

Adam, P. 1998. Biodiversity – the biggest of big pictures. Pp. 6–14 in *Is the biodiversity tail wagging the zoological dog* Edited by Lunney, D., Dawson, T. and Dickman, C. Royal Zoological Society of New South Wales, Mosman,

Ashton, P. and Cornwall, J. 2006. Corraling conflict: the politics of the Australian Federal heritage legislation since the 1970s. *Public History Review* 13: 53–65.

Australian Bureau of Statistics. 2004. *Australian Yearbook*. ABS, Canberra.

Badman, T., Bomhard, B., Fincke, A., Langley, J. Rosabal, P. and Sheppard, D. 2008. *Outstanding Universal Value. Standard for Natural World Heritage*. IUCN, Gland.

- Bowman, D. M. J. S. 2000.** *Australian rainforests: islands of green in a land of fire*. Cambridge University Press, Cambridge. <https://doi.org/10.1017/CBO9780511583490>
- Brocx, M. 2008.** *Geoheritage – from global perspectives to local principles for conservation and planning*. Western Australian Museum, Perth.
- Carpenter, R. J., Holman, A. I., Abell, A. D. and Grice, K. 2016.** Cretaceous fire in Australia: a review with new geochemical evidence, and relevance to the rise of the angiosperms. *Australian Journal of Botany* **64**: 564 – 578. <https://doi.org/10.1071/BT16109>
- Cavanaugh, J., Ogilvie, P. and Adam, P. 2010.** The World Heritage nominations. Pp. 273–284. In *Remnants of Gondwana. A natural and social history of the Gondwana rainforests of Australia*. Edited by Kitching, R., Braithwaite, R. W. and Cavanaugh, J. Surrey Beatty, Chipping Norton, NSW Australia.
- Coper, M. 1983.** *The Franklin Dam case: commentary and full text of the decision in Commonwealth v The State of Tasmania*. Butterworth, Sydney.
- Diels, L. 1906.** *Die Pflanzenwelt von West-Australien südlich des Wendekreises*. In *Vegetation der Erde VII*. Edited by Engler, A. and Drude, O. Englemann, Leipzig.
- Dowling, A., Peacock, R. and Ramsay, H. 2014.** Some new and noteworthy bryophytes from Antarctic Beech (*Nothofagus moorei*) forests of north-eastern New South Wales. *Telopea* **17**: 239–250. <https://doi.org/10.7751/telopea20147788>
- Edwards, P. 2011.** *Robert Marsden Hope and Australian public policy*. Office of National Assessments, Canberra.
- Floyd, A. G. 1990.** *Australian rainforests in New South Wales*. Two volumes. Surrey Beatty, Chipping Norton, NSW, Australia.
- Francis, W.D. 1990.** *Australian rainforest trees: excluding the species confined to the tropics*. Government Printer, Brisbane.
- Gee, H. and Fenton, G. 1978.** *The South-West book: a Tasmanian wilderness*. ACF, Melbourne.
- Greer, G. 2014.** *White Beech. The rainforest years*. Bloomsbury, London.
- Heenan, P.B. and Smissen, R. D. 2013.** Revised circumscription of *Nothofagus* and recognition of the segregate genera *Fuscospora*, *Lophozonia*, and *Trisyngyne* (Nothofagaceae). *Phytotaxa* **146**: 1 – 31. <https://doi.org/10.11646/phytotaxa.146.1.1>
- Hill, R.S., Jordan, G.J. and Macphail, M. K. 2015.** Why we should retain *Nothofagus sensu lato*. *Australian Systematic Botany* **28**: 190 – 193. <https://doi.org/10.1071/SB15026>
- Hope, R. M. 1974.** Report of the National Estate. *Report of the Committee of Inquiry into the National Estate*. AGPS: Canberra.
- Hunter, R. J. 2004.** *World heritage and associative natural values of the central Eastern Rainforest Reserves of Australia*. www.environment.nsw.gov.au/resources/parks/CERRA-values-report.pdf
- Isaacs, S. 1982.** *Report of the Terania Creek Inquiry by the Honourable Simon Isaacs QC*. Three volumes. New South Wales Government Printer, Sydney.
- Kitching, R., Braithwaite, R. J and Cavanaugh, J. 2010.** The Gondwana rainforests of Australia – introduction. Pp 1–10 in *Remnants of Gondwana. A natural and social history of the Gondwana rainforests of Australia*. Edited by Kitching, R., Braithwaite, R. W. and Cavanaugh, J. Surrey Beatty and Sons, Chipping Norton, NSW Australia.
- Kooyman, R. M. and 13 others. 2014.** Paleo-Antarctic rainforest into the modern old world tropics: the rich past and threatened future of the “southern wet forest survivors” *American Journal of Botany* **101**: 2121–2135. <https://doi.org/10.3732/ajb.1400340>
- Low, T. 2014.** *Where song began. Australia's birds and how they change the world*. Viking, Melbourne.
- Magin, C. and Chape, S. 2004.** *Review of the World Heritage Network: Biogeography, Habitats and Biodiversity*. IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK.
- Martin, H. A. 1978.** Evolution of the Australian flora and vegetation through the Tertiary: evidence from pollen. *Alcheringa* **2**: 181–220. <https://doi.org/10.1080/03115517808527776>
- Martin, H. A. 1981.** The Tertiary flora. pp. 391–406 in *Ecological biogeography of Australia*. Edited by A. Keast. Junk, The Hague. https://doi.org/10.1007/978-94-009-8629-9_13
- Mitchell, L. (With contributions by Leitao, L., Migon, P. And Denyer, S.). 2013.** *Study on the application of Criterion (vii) in considering superlative natural phenomena and exceptional natural beauty within the World Heritage Convention*. IUCN World Heritage Study 10. IUCN, Gland.
- Müller, R.D., Flament, N., Matthews, K.J., Williams, S.E., and Gurnis, M. 2016.** Formation of the Australian continental margin highlands driven by plate–mantle interaction. *Earth and Planetary Science Letters* **441**: 60–70. <https://doi.org/10.1016/j.epsl.2016.02.025>
- New South Wales Government. 1984.** *Nomination of New South Wales rainforest for inclusion in the World Heritage List*. New South Wales Government, Sydney.
- Percival, I. G. 1979.** *The geological heritage of New South Wales*. Report prepared for the Australian Heritage Commission and the Planning and Environment Commission of New South Wales, Sydney.

- Pidcock, K. 2005.** The best and worst of times. Pp. 59 in *In the living forest. An exploration of Australia's forest community*. Edited by J. Keeney. etNcom, Sydney.
- Richards, P. W. 1952.** *Tropical rain forest: an ecological study*. Cambridge University Press, Cambridge.
- Rose, P. 2014.** A conceptual model of the species composition of the original riparian rainforest of the Clarence River Floodplain, New South Wales. *Cunninghamia* **14**: 153–178. <https://doi.org/10.1016/j.epsl.2016.02.025>
- Schimper, A. W. F. 1903.** *Plant-geography upon a physiological basis*. Translated by W. R. Fisher, edited by P. Groom and I. B. Balfour. Clarendon Press, Oxford. <https://doi.org/10.5962/bhl.title.122577>
- Somerville, J.G. 2005.** *Saving the rainforest. The NSW campaign 1973–1984*. Privately published.
- Stevens, T. 2016.** Joe Glascott 1931–2016. Influential journalist was instrumental in saving NSW rainforests. *The Sydney Morning Herald* 31 January 2016 p35.
- Tansley, A. G. 1945.** *Our heritage of wild nature*. Cambridge University Press, Cambridge.
- Thurley, S. 2013.** *Men from the ministry. How Britain saved its heritage*. Yale University Press, New Haven.
- Tng, D.Y. P. John, G. J., Bowman, D. M. J. S. 2013.** Plant traits demonstrate that temperate and tropical giant eucalypt forests are convergent with rainforest and not savanna. *PLoS ONE* **12**: e84378. <https://doi.org/10.1371/journal.pone.0084378>
- Tng, D. Y. P., Goosem, S., Jordan, G. J., Bowman, D. M. J. S. 2014.** Letting be – rethinking active fire management of old-growth forest in the Australian tropics. *Journal of Applied Ecology* **51**: 555–559. <https://doi.org/10.1111/1365-2664.12233>
- Turvey, N. 2006.** *Terania Creek, rainforest wars*. Glass House Books, Brisbane.
- Vader, J. 1987.** *Red Cedar. The tree of Australia's history*. Read books, Sydney.
- Warnam, L. and Moles, A. T. 2009.** Alternative stable states in Australia's wet tropics: a theoretical framework for the field data and a field-case for the theory. *Landscape Ecology* **24**: 1–13. <https://doi.org/10.1007/s10980-008-9285-9>
- Warnam, L., Bradford, M. G., and Moles, A. T. 2013.** A broad approach to abrupt boundaries: looking beyond the boundary at soil attributes within and across tropical vegetation types. *PLoS ONE* **8**(4) e60789.
- Webb L. J. 1959.** A physiognomic classification of Australian rain forests. *Journal of Ecology* **47**:551–570. <https://doi.org/10.2307/2257290>
- Webb, L. J. 1968.** Environmental relationships of the structural types of Australian rain forest vegetation. *Ecology* **49**:296–311. <https://doi.org/10.2307/1934459>
- Webb, L. J. and Tracey, J. G. 1981.** Australian rainforests: patterns and change. Pp. 605–694 in *Ecological biogeography of Australia*. Edited by A. Keast. Junk, The Hague. https://doi.org/10.1007/978-94-009-8629-9_22
- Webb, L. J. Tracey, J. G. and Williams, W. T. 1984.** A floristic framework of Australian rainforest. *Australian Journal of Ecology* **9**:169–198. <https://doi.org/10.1111/j.1442-9993.1984.tb01356.x>
- Webb, L. J., Tracey, J. G., Williams, W. T. and Lance, G. M. 1970.** Studies in the numerical analysis of complex rainforest communities. V. A comparison of the properties of floristic and physiognomic–structural data. *Journal of Ecology*, **58**: 200–232. <https://doi.org/10.2307/2258177>
- Weston, P. H. 2014.** What has molecular systematics contributed to our knowledge of the plant family Proteaceae? Pp. 365–397 In *Molecular plant taxonomy methods and protocols*. Edited by P. Besse. Springer Science, New York. https://doi.org/10.1007/978-1-62703-767-9_18
- Yenken, D. 1982.** Jewels and old shoes: Recollections of the Australian Heritage Commission. *Historic Environment* **1**: 4–9